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St. Peter's; and Bernini's Colonnades (In Illustration of Professor Aitchison's Royal Academy Lectures)..... *Extra Large Page Ink-Photo.*
The Courtyard of the Archbishop's Palace, Milan; and one of the Towers of the Castle (as restored under Signor Moretti).. *Double-Page Ink-Photo.*
Design for an Entrance Gateway to a Public Park (Royal Institute of British Architects' Tite Prize, 1901; Second Prize).—
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Some Cities of Modern Italy—Milan.

MILAN is the most important commercial city in Italy, and perhaps in that sense it may be looked upon as the veritable capital of the new kingdom. But with the large influx of foreign residents during the last quarter of a century, a great deal of its national character is disappearing, and it is becoming a cosmopolitan and consequently uninteresting town. Its modern streets, lined with brass-plated doorways and plate-glass fronted shops, with an endless variety of foreign names inscribed, remind one of any other ordinary European capital. In Naples, Rome, or Florence the huge modern palaces are still constructed in the old manner, their ground-floors honeycombed with quaint little shops, amongst which the *portone*, or principal entrance of the palace, affords entrance into the invariable spacious courtyard. But in Milan the ground has become too valuable of recent years, and economical planning is practised as much as in London. Old local characteristics, which give so much interest to ordinary Italian towns, carried on as they often have been through the nineteenth century, are now quite abandoned in the modern buildings, and with this abandonment the architectural aspect of the city has fallen to a very low level. It is true that the Victor Emmanuel Gallery, a species of gigantic Burlington Arcade, with transepts, built by an Anglo-Italian company forty years ago, may be considered to have a unique and local modern character. It is on a grander scale than anything of the kind elsewhere, but its architecture is of the very poorest description, and it can hardly be considered to compensate for the disappearance of the long-drawn mediæval arcades and grand old palaces, which must have formerly occupied its site, and the centre of the ancient city. This "Galleria" is, at the present time, in course of "restoration," after only forty years of existence. Illustrations of it will be found in a very long ago number of the *Builder* of contemporary date.

The development of the city since 1860 has been enormous, and to a great extent unprepared for. The *octroi* limit has recently been extended to embrace more than double the space of twenty-five years ago. The value of property has risen to such an extent that a benevolent society, instituted to provide dwellings for the poor turned out of their homes by the alterations of those days, and which built a considerable modern quarter of the town for that purpose, is now receiving 50 per cent. more income than the shareholders are permitted to accept in accordance with their rules. The unfortunate society is embarrassed with its riches, and a difficulty has arisen as to the disposal of the ever-increasing surplus.

Although not so early in the field of modern development as Florence, Milan was perhaps the first of the Italian cities to make a clean sweep of many filthy lanes and dilapidated houses which blocked up its centre before 1860. But, alas! in the progress of "sventramento" and "risanamento" almost every trace of mediæval architecture, excepting the little group of buildings surrounding the Piazza dei Mercanti, has disappeared. Hardly another city of Italy has suffered so severely. This drastic measure may have been necessary, but it has destroyed all artistic interest in a famous old European city, the theatre of great historical events.

A few over-restored old churches, once suburban, now enveloped in districts of modern houses, are the only mediæval monuments left to recall its ancient history. The Sforza and Visconti have long ago faded into oblivion, as far as monuments are concerned; their few memorials are very hard to find; and such few buildings as survive, which can at all be associated with them, have been rebuilt and restored beyond recognition. Milan appears to have suffered from a careless destruction of ancient monuments at the time of its great development in 1860. Before the "Unity of Italy," the city was an ordinary, old-fashioned provincial capital, where the local aristocratic families resided in their ancestral palaces, in old Italian patriarchal fashion. But the times and also the manner of living have changed since then. A flood of modern speculation and commercial activity has swept away the old social order and mode of existence, and the palaces, abandoned by their owners, who now live either on their country estates or in modern suburban villas, are tenanted as houses of business, or, still harder fate, have become commercial hotels. Most of these old palaces, situated in what were once suburbs, and which have consequently escaped the "sventramento," are of a very pronounced *barrocco* style. One of the largest, the Palazzo Litta, on the west side of the city, covering acres of ground, and with a long front of poor seventeenth-century design, is now turned into the central railway administration, a kind of use for which such buildings serve very well. The gardens of the old palaces have in all cases, of course, been transformed into sites for the new tenement houses.

The new suburbs of Milan are in the highest degree depressing and uninviting. They consist, with only one exception, of factory districts, with their accompanying slums of workmen's dwellings, which even an Italian sun fails to redeem from the most sordid and miserable aspect. A fashionable quarter has sprung up within the last few years, surrounding the remains of the mediæval castle, to accommodate the *nouveau riche* class of speculators and bankers, which directs the modern life of the city. The houses in this district are the usual six-storied Parisian tenement-palaces, in which luxury, combined with economy of space, are ruling features. Planted boulevards, pretentious shops, and, in some places, the "maisonette" type of property, give the effect of a French or German town. The buildings are terribly commonplace in their

design, and utterly uninteresting, although built of very costly materials and loaded with ornament. In one or two cases "Mansard" roofs have been attempted—and in Italy!

Although there are absolutely no private buildings in Milan worthy of attention or of any architectural interest or value, there are several important rebuildings at present in progress, under the auspices of the "Ufficio Regionale" for the preservation of ancient monuments of the district, which are worthy of notice.

This Government Department or "Ufficio," now established in every provincial capital of Italy, which in its present form dates from about 1890, is an institution needing some explanation to English readers. Copied to some extent, presumably, from a similar Government Department in France, its scope embraces not only the necessary reparations and restorations of buildings actually in the service of Government officials, such as the clergy, schoolmasters, public offices, &c., but it also exercises a control and supervision over such private property as may be considered to possess artistic or historical associations. It is of course specially concerned with all work of an architectural character, comprising fresco paintings and sculptures, but in addition to what may be considered "fixtures," the department must also be consulted in any case of removal or translocation of mere furniture of an important description. The powers of the department in this latter direction appear to be exercised to a large extent, and up to the present without serious opposition. Such a Government institution would perhaps be hard to understand in England, where vested interests and personal rights in property, in such a sense, are more jealously regarded than in Italy. Our nearest approach to such an institution is perhaps the Society for the Protection of Ancient Buildings; which, however, has not of course the same official status.

As far as any one can at present judge, the influence of this department on the preservation of artistic and historical memorials in Italy is distinctly beneficial. The officials of the department seem animated with an intelligent desire to carry out the principles of modern conservativism and preservation, as opposed to the vulgar "restoration" of the past century. In the case of private property, the presumable "red tape" and officialism of a Government administration are probably the best means possible for delaying the ravages of the private "restorer." Public buildings rebuilt or restored by the department directly, run the danger of being overdone, as was the case with France in the days of Viollet-le-Duc; but in Italy the better taste of modern days, combined with greater economy of means at disposal, will prove a safeguard.

The rebuilding of the mediæval castle of Milan is the most imposing of the works at present being carried out by the "Ufficio" of Lombardy. A committee of the citizens is assisting the work with subscriptions, and when finished it will become the home of several learned, artistic, and educational societies, as well as of two or three museums. Although considered a "restoration," very little of the original fifteenth century building remained ten years ago to be "restored." Its walls, cut down to half their original height, were encumbered with sheds and hovels both inside and out, and its appearance was entirely devoid of any character. Such architectural details as existed in the form of entrances into the enclosure used as a barrack were in the Napoleonic "Empire" style. The imposing towers and battlements which are now rising around the old courtyards are consequently due to the ingenious study of Signor Moretti, the architect in charge of the work. When finished, this "restored," or rather new, castle promises to be a very creditable and satisfactory effort. It represents a careful study of similar buildings in a style peculiar to the Lombard district, many examples of which, seen from the railways of North Italy, impress the traveller with their immense size and simple outlines. Unfortunately, the Castle of Milan, instead of being surrounded by open country, or even the usual concomitants of an old city in harmony with its character, is now constituted the centre of an enormous semicircle of the most ordinary-looking modern houses, which, although individually very large, look singularly mean and small under the circumstances. Such a background for such a monument is singularly unfortunate; it is as if the central part of the Tower of London were set down in the middle of a Bayswater square.

By the courtesy of Signor Moretti, chief of the Lombard "Ufficio," we are enabled to give two of his photographs of the castle specially taken for the *Builder*, together with a view of the restored interior of the Archbishop's Palace — the "Arcivescovàdo" — which has just been completed under his supervision (see lithograph plate).

The Palace of the Archbishop of Milan has been so much rebuilt in successive ages, especially in the eighteenth century, that it is wonderful that so early and characteristic a Renaissance feature as this cortile should survive. The curious projecting balcony, carried on consoles over the columns, is a very unusual treatment. The building is of brick, with stone architectural details; the walls are covered with painted decorations.

The beautiful church of St. Maurizio, filled internally with the frescoes of Bernardino Luini, has recently been repaired in a truly conservative spirit; not a particle of stonework has been renewed, except where it was absolutely necessary for structural purposes, and no new carving or painting has been introduced anywhere.

Concerning the Cathedral of Milan, some years ago a Milanese gentleman died, leaving a considerable sum of money for the purpose of reconstructing the west front. An international competition, as our readers may remember, was held for the purpose, and a series of designs appeared, which were all about equal in merit, and neither better nor worse than the florid and rather weak Gothic exterior of the building they were intended to complete. The intention is now to carry out the design of the late architect Brentano, whose design received the first place in the competition; the "Ufficio Regionale" intervening in the interest of any archæological discovery which may be made during the progress of the work.

Another bequest for beautifying this cathedral was made a few years back, with the object of providing bronze doors for the future west front. For various reasons—the disinclination of the Milanese sculptors to descend to mere decorative work, and some element of uncertainty about the scheme—the public competition was very poorly responded to, and the matter has for the present been shelved.

THE RUSKIN EXHIBITION.

THE exhibition of Ruskin's drawings at the Gallery of the Society of Water-colours is calculated to confirm the opinion we have more than once expressed, that Ruskin would have been a greater man, and would have left a more incontestable reputation behind him, had he devoted his powers to producing art instead of writing so much about it. True, his genius as a master of literary expression is as undeniable as his mastery with pencil and brush, but he has expended this literary genius on a great deal of exceedingly questionable art-criticism, while of the results of his work as an artist, so far as it went, there can be no question whatever. The present exhibition is one of the most interesting and varied that has ever appeared in that gallery, although all the work of one man; and it ought to be specially interesting to architects, for it contains some of the most beautiful architectural drawing ever seen. In this class of subjects Ruskin's work is remarkable not only for its accuracy and clearness of line and perspective, but for the unerring manner in which he gives the true character of the subjects he handles. The most practised architectural sketcher, who has devoted himself entirely to this class of drawing, could hardly rival some of the work to be seen here. Notice especially for instance, in the "Fountain at Rome" (11), a pencil drawing on toned paper slightly tinted with the brush here and there, the beautiful clean drawing of the front of a classic building seen in sharp perspective on the left, and which, rather than the fountain, makes the real subject of the picture. Notice also, near this, the "Market-place at Abbeville—Study for Detail" (6), a view of an old city square in which every characteristic of the various buildings is faithfully followed out and drawn, down to the most insignificant detail. The wonderful water-colour study of a portion of St. Mark's (19) has been exhibited in this room before; a second examination can only confirm one's opinion of its surpassing truth and delicacy of handling; and an almost equally remarkable one is that of an angle of the Ducal Palace (229), with the row of shafts and capitals down the side of the building, in the sharpest perspective, all followed in their intricacies and conscientiously drawn. In the pencil sketches on toned paper, slightly shaded here and there with the brush, it is remarkable what amount of distance and aerial perspective he obtains, in a medium difficult to get such an effect with, by the judicious introduction of a bit of rather more strongly shaded masonry in the foreground, throwing all the rest into its place; perhaps the very best example of this is in the beautiful sketch on "The Aventine" (144); an ideal of what an architectural sketch should be. The more elaborate and finished drawing of Abbeville, again (234), in which more colour is used, is wonderful in its completeness of effect and the careful manner in which the more distant bits of the architectural scenery are worked out. In quite

another manner the sketch with a soft pencil of the "Chapel at Reu, near Abbeville" (175), labelled "six hours' work," is quite masterly in its rapid but complete indication of the architectural detail. Ruskin's determination to secure a study on a large scale, even when he had no large paper at hand, is amusingly illustrated in the at first puzzling water-colour drawings which seem to be divided up into parallelograms of slightly varying scale of colour, having been originally made, piece by piece, on the separate leaves of a small sketch-book, which were then pasted down in position on a larger sheet of paper or card, as in No. 191 and one or two others. Then there is an admirable colour study of the coloured marble front of San Miniato; a fine colour study of the pier in the porch of St. Martin's Lucca (38); details and colour of the apse in the Duomo at Verona, covered with written notes; the "Castelbaroc Tomb, Verona" (92), a coloured elevation admirable in its representation of the texture as well as the colour of the different materials; "Spandril—Pisa" (125), a small sketch in which again the texture of the marble is admirably conveyed. Among the pencil and tint sketches, besides those already mentioned, some especially good ones are "Castel Vecchio" (27); "Castel del Uovo, Naples" (155); "Street in Naples" (166); "Fountain at Verona" (176); "Naples" (251); "The Prentice's Pillar, Roslin" (266—pencil only); "Bologna" (270), showing strongly the influence of Prout; "The South Transept, Melrose" (276—pencil only); and "Porta Capuana, Naples" (290).

The landscape studies are not equal to the architectural ones, except in cases where buildings enter considerably into the scene. In purely landscape subjects, Ruskin, in accordance with his own principles expressed in one passage in "Modern Painters" (though he practically contradicted it on other pages), seems to have been aiming at recording accurately the geological or other facts of the scene rather than at giving its poetic impression, and the landscapes are accordingly more valuable as records than as impressions. Exceptions to this are "On the Lake of Geneva" (289), and "The Pass of Killiecrankie" 368), which are fine landscape studies of effect, the latter especially. There are many other various classes of drawings; colour-studies of birds; an admirable one of a crab, in which both the colour and texture of the carapace are remarkably given; bits of carved detail drawn with great delicacy, and an exquisite little study of a spray of leaves (12). But the highest value of the collection lies in the architectural studies, which form in themselves a practical evidence how genuine was Ruskin's love of architecture, whatever may be thought of some of his opinions about it. Hardly anything in the collection, it is true, is really finished; the drawings are all the work of one who drew solely for his own pleasure or practice, and left off when his own object was attained; and it may be argued (he would perhaps have argued himself) that this is an essentially amateur attitude in art, and that there is a great gulf between the best sketch or study and a finished picture. Yet this exhibition seems to give evidence enough that the author of these drawings could have gone further in practical artistic production had he made up his mind to it. In architectural sketching, at all events, his works are a perfect model, and architectural students should not miss this opportunity of considering them carefully.

NOTES.

Post Office. Monopolies.

A COMMUNICATION appeared in the Press recently pointing out the advantages of the Post Office Express Delivery Services. Many people are unaware that they can telephone a message of thirty words to a post-office for delivery by a messenger at the ordinary express rate of 3d. per mile. These telephonic facilities were promised by the Post Office to the National Telephone Company when they took over the trunk lines of the latter. It is thus possible for many business firms in London to send a message of thirty words to clients residing within a mile of Metropolitan post-offices quicker and at half the price that twelve words would cost by telegraph. As the Post Office will soon be competing with the National Telephone Company, it is only right that the privileges of the latter company should be known. In the opinion of many it is time that the legal decision in the case of the Attorney-General *v.* The Edison Telephone Company, of London, should be revised. As Dr. Fleming says, the judgment virtually amounts to this, "that the Post Office possesses the sole right to transmit intelligence for profit," not only as the art was known in 1880, "but by any and every means which the wit of man might through endless ages devise." A fitting commentary on this is that the Post Office makes a loss on its own proper telegraph business, which it works itself, and takes over 100,000*l.* a year in royalties from the National Telephone Company, which it does not work. It is hardly fair to inventors that all methods of transmitting signals, sounds, or visual images, whether with or without wires, and all methods by which one human mind can affect another intelligently, must not be practised for profit in this country unless the Post Office obtains the lion's share of the profits and runs none of the risks. As the ether is supposed to fill infinite space, its monopoly by the British Post Office is rather ludicrous. If this monopoly were being administered in the best way no great harm would be done; but if it is used, as we are afraid that it sometimes has been used in the past, to drive electrical inventors out of the country, then it is time that the whole question should be reopened.

Trolley Wire Accidents.

THE accidents that occurred in Liverpool on Monday night illustrate very forcibly the danger of having overhead trolley and telephone wires in the same streets. During a heavy fall of snow the telephone wires suddenly gave way and, making contact with the trolley wire, they became a source of the greatest danger to the people in the streets. Two men were killed outright, and many people were taken to the hospital suffering severely from electrical shock. There were many dreadful scenes of people in agony unable to free themselves from contact with the wires. Efforts were made to relieve them by cutting at the wires with a hatchet, and as promptly as possible the current was cut off. As the accidents happened during the night in a blinding snowstorm they might easily have been much worse. Even a wireman with rubber shoes and gloves and insulated pliers would have taken some time to clear away the débris of some fifty telephone wires in the dark, and the operation would not have been free from danger. These accidents were very similar to one at Vienna, which we described two or three months ago, and the same conclusions are to be drawn. When an overhead trolley wire is used for electric traction, telephone, and telegraph wires should be placed underground. It has been proved over and over again that the so-called guard wires are very inefficient, and are in themselves a source of danger, as it is always possible that they might break. Accidents like this one at Liverpool will do harm to the cause of electric traction in this country, and those electricians who desire that the people should have the benefit of a cheap and rapid means of locomotion would do well to take precautions, so that similar accidents would be a physical impossibility.

Hampstead Heath Protection Society.

THE Hampstead Heath Protection Society have issued their fourth annual report. The Committee have been in frequent communication with the London County Council in regard to various points which they consider require attention or alteration, but apparently not with very satisfactory results. Among other things they have called the Council's attention to the cast-iron drinking-fountains lately placed on the Heath, and have suggested that any fountains placed in future on the Heath should be of rough stone or some suitable material, and more in harmony with the character of the surroundings; a recommendation with which we entirely concur. They have also given attention to the question of the bare state of the banks of some of the ponds on the Heath, and have suggested to the London County Council, as a beginning, some practical steps which might be taken for restoring the natural aspect of the banks of the Leg-of-Mutton Pond; but what they mean by the "natural aspect" is not very clear. The Committee have also been in correspondence with the New River Company, who have acceded to their request that the banks of the newly enlarged reservoir on the summit of the Heath should be planted with suitable trees and shrubs. The Committee are watching with much anxiety the proceedings of the promoters of the proposed extension of the Charing Cross, Euston, and Hampstead Railway in the direction of Golder's Green and Hendon. They are in communication on this subject with the Commons Preservation Society, the Metropolitan Public Gardens Association, and the Hampstead Borough Council, with a view of co-operating in opposition to any features of the scheme which would be injurious to the Heath. They deprecate any tunnelling under the Heath, and the erection of any station which would in any way encroach or infringe upon it, and here also they are perfectly right. Unless a strong stand is taken the Heath might be practically ruined as far as its true beauty and its value to Londoners are concerned.

The Rating of Montague House.

THE difficulty of arriving at a satisfactory value, for rating purposes, of great mansions has been well exemplified by the appeal which came before the County of London Overseers in regard to the rating of the Duke of Buccleuch's well-known mansion, Montague House. The old rating was:—Gross value, 4,200*l.*; rateable value, 3,500*l.* These figures had now been raised to 5,500*l.* and 4,584*l.* respectively. Not only did the Duke say, on his appeal, that these figures were too high, he went so far as to ask that the figures of 1890 and 1895 should be lowered, on the ground that the residential value of property in Westminster had declined. The contention of the Local Authority was that the letting value of such a house was not the right criterion, and that the proper way to arrive at its true value was to take 4 per cent. interest on the actual cost of the structure and adding to that the ground-rent and land-tax. The court, judiciously, no doubt, gave no opinion on the basis to be adopted, but allowed the appeal by reducing the figures to 4,500*l.* and 3,750*l.* respectively. So far as we can judge, this means that the court did not accept the respondent's method of valuation, but, at the same time, believed that property in Westminster was more valuable than it was five years ago. As a matter of fact, such a building as Montague House could always have a high value for other purposes than those of a nobleman's residence. It is clear, however, that a rough-and-ready valuation, based to some extent on the rent obtainable and similar considerations, is not the only means of arriving at the rateable value of these great houses, for the county, aspect, locality, and many other circumstances would seem to have to be considered.

Sanitary State of Nuneaton.

DR. R. W. JOHNSTONE'S report to the Local Government Board upon the causes of epidemic enteric fever in Nuneaton and Chilvers Coton Urban District shows the old and oft-repeated story of contaminated soil coupled with water supply from shallow wells. It appears that house refuse and excrement are generally disposed of by means of midden privies, the receptacles of which are not always protected from the rain, and are often sunk several feet below the surrounding ground level. These middens, when full, are emptied by the Urban District Council, sometimes not more often than four times a year. Where they are not lined with impervious material, their contents soak into and pollute the surrounding soil. Water supply is largely from shallow wells, and old and leaky slop-water drains frequently pass close to the mouths of wells. Dr. Johnstone had a few wells opened, and a section was prepared by the surveyor showing their water levels as compared with the level of sewers in the infected area. As far as could be judged from the few wells represented in the section, it seemed that the water levels in the different wells of this area corresponded one with another, and hence it was not impossible that specific contamination of the ground water might influence the water of several wells. It only remains to add that all the wells examined were dry-steined with brick, and the tale seems complete.

SECOND ROYAL ACADEMY LECTURE ON ST. PETER'S.*

WE can hardly in thought put ourselves in the position of the men of the Renaissance, for to them it was a time of joy and ardent enthusiasm. This grand movement in the fine arts may be said to be of purely Italian origin; if not of Florentine, at least of the cities of the Val d'Arno. We know from Dante of the factions by which Florence and the neigbouring cities were torn and of the suffering of Milan at the hands of the Germans, but so great were the evils of the factions in Florence that Dante is always calling on the Emperor to come and rule this part of his empire. The Latin classics were much read in Dante's time by the advanced men, and shortly after his death Greek began to be closely and passionately studied. Boccaccio, from the advice of Petrarch, became one of the first notable Italian students of Greek. The Tuscans are supposed to have come from a Greek stock, and the air of Florence is both healthful and exhilarating, and the Tuscans were particularly keen witted and astute. Tuscany gave us Dante, Petrarch, Boccaccio, and Machiavelli.

At the beginning of the thirteenth century Nicola Pisano had seen the superiority of Roman sculpture and copied and imitated it, and towards the end of the century Brunellesco and his friend Donatello, both sculptors, made their fateful journey to Rome and were both struck with the magnificence and elegance of the antique buildings and ruins there. Brunelleschi, who had sold a farm to go, and spent all the money he had started with, eked out a livelihood by his old trade of goldsmith and jeweller, which gave him the means of studying the Roman buildings and of investigating the Roman method of building domes, which after his return he put in practice in the doming of Santa Maria del Fiore (St. Mary of the Flowers).

Brunelleschi died in 1444 (the year that Bramante was born) after doing much work, doming the Cathedral, building the Pitti Palace, the church of St. Spirito at Florence, and much work elsewhere, as he thought in imitation of Roman work, but really infusing into his buildings the grace and simplicity of Classic work.

The novelty of the new architecture took the fancy of the Florentines and others, and the comparative simplicity, dignity, and elegance of Roman architecture not only satisfied the desires of the Italians, but by degrees took captive the whole of Christendom. Vasari, who was born in 1512 and died in 1574, and may well be taken as a judge of the opinions of his time, says of Brunellesco, "he was of so lofty an intellect that one may well say that he was sent by heaven to give a new form to architecture, already gone astray for hundreds of years, in which the men of those times had wrongly spent much treasure in making buildings without order, in an evil manner, of wretched design, with strange inventions, with ungraceful grace, and with worse ornament." Here you see the Renaissance opinion of Gothic.

Nothing can be said against the sculptor's and painter's taste; but a monument of architecture is not only a thing to look at—like a picture or piece of sculpture—for delight, but the architectural monument is intrinsically costly and for use as well as for delight; it is also a specimen of structural science which requires a profound knowledge of statics. This knowledge can only be acquired inexpensively by theory, or very expensively by practice; the mediævals had to learn it by practice, and for nearly a century the elements were taught by the buildings put up falling down or going to ruin. But this is not all, for we may make trifling errors without failure, if we have ample means, by making those parts where the main strains occur twice, thrice, or four times as strong as is necessary. The mediævals were debarred from this, as those ages were very poor, so that unnecessary strength could not be afforded, and the mediæval architects carried slightness to such a pitch that the loss of substance by weather-wear in a few hundred years has rendered many mediæval buildings unsafe, and if the weakened parts had not been replaced with stronger parts in our own time the structure would have failed, if not have fallen down. This was primarily due to the weakening by weather-wear of the flying buttresses, so that they could no longer resist the pressure of the vaults, while the fine open tracing of late Gothic has so perished that it looks like torn lace.

Skill in building is commonly reckoned by the ratio of the points of support to the whole area of the building, and Gwilt gives the proportion of the points of support to the whole area in the Pantheon at Rome as 0·232, which has stood since 13 A.D., or for 1,762 years.

The following is the ratio of points of support to total area in five other celebrated buildings:—

St. Peter's at Rome	0·261
St. Sophia, Constantinople	0·217
The Cathedral at Florence	0·201
St. Paul's, London.....	0·170
St. Geneviève, Paris	0·154

I have only given the buildings with large domes, for in my opinion any other comparison is inapplicable, the small difference in the decimal does not strike one, but when you consider that the points of support in St. Peter's are 59,308 square feet, or nearly double the whole area of the Pantheon (which is 34,328 feet), you will judge how enormous it is, and you see by comparison that it is a larger proportion of the whole area than that of any other notable domed building. We suppose that Bramante had become an architect, and had at least some rough method of ascertaining whether his piers would sustain the weight of the dome, though we know that some of the piers showed signs of weakness before they were loaded. They were built up continuously day and night, probably without proper supervision. But Michelangelo never had the training of an architect, and all he could have learned about doming was from studying the cathedral at Florence. Ware says he was lucky in having Giacomo della Porta to do the doming and to put the requisite bands to restrain the thrusts in the dome and drum. As it is, the buttresses of the drum have cracked away from the other work and been cramped to it with iron ties.

The public should know that architecture is a structural science, and also that no important building should be undertaken without complete drawings and a model, while till Michelangelo had his model of the dome made, the whole design of St. Peter's was in a constant flux.

St. Peter's is said to have cost 46,800,000 scudi, nearly 10,000,000*l.* sterling, but looking at the purchasing power then, the 46,000,000 scudi may be looked on as pounds now.

It is to be regretted that Bramante did not have St. Peter's to build when he was in the fulness of his powers, instead of having only eight years at the end of his life; that he did not leave a complete set of drawings and a perfect model, for he was in my opinion the greatest architect of the Renaissance, and though he began as a painter, I think that we may believe that he made himself an architect; there was a suave beauty about all his works that I know that is enchanting. Bramante's first scheme for St. Peter's seems to have been a square with sides 450 ft. long made on plan into a Greek cross by the crossing of the nave and transept* with the same length of arm, whose ends form square projections one in the middle of each side, roughly 130 ft. wide, and 43 ft. projection from each side of the square. The nave and transept are about 93 ft. across from wall to wall, ending in semicircular apses about 80 ft. in diameter; the clear length of each internally is about 512 ft., there are two aisles to the nave and transept, the narrowest part of each of these aisles is about 40 ft. between the pilasters, and the aisles are about 370 ft. long and have semicircular apses at both ends about 30 ft. in diameter, kept back about 30 ft. from the face of the building, making eight porticos. The four angles of the large square are sacristies, about 60 ft. square internally, and were to be carried up as bell towers. In a later scheme on the same basis two columns are put between the narrow openings of the aisles which would have spoiled the vistas. These aisles and their chapels suggest top lighting. The blocking up of the vistas of the nave and transept aisles had been skilfully avoided by making the aisles clear of the piers of the dome. The dome seems to have been designed of the same diameter as the actual dome that was erected. There appears to be no elevation or section of Bramante's design that has come down to us beyond that on the medal struck in commemoration of the first stone being laid in 1506 by Pope

* By Professor Aitchison, R.A.

* See plan in the last issue of the *Builder*, page 106.

Half Section of the Dome of St. Peter's (no scale).

Julius II., and what is shown in Serlio's book, so that we cannot know what lighting could be got from the clearstories. The view of Bramante's front of St. Peter's, taken from a medal 2 in. in diameter, does not strike one as being quite happy, but it was probably done in a hurry for the die-sinker; the bell-towers are ugly, but we may be quite sure that had the designs for their execution come from Bramante's hand, they would have had the grace and beauty that pervaded all his works. Of all the designs that Baron H. de Geymüller has given, the one from a drawing on which Antonio da Sangallo the younger has written on the back is, in my opinion, the most successful, only the bell-towers are rather too wide for the centre.

We must recollect that Bramante had such fertility of genius that he could sketch out at once his schemes, so we need not be surprised at the number of sketches that have come down to us; and as in the latter part of Bramante's life he was afflicted with palsy, he was obliged to have some architect or draughtsman to put into form his descriptions and palsied scrawls, and this, in Baron de Geymüller's opinion, is why many of his designs have been attributed to B. Peruzzi.

One must not be surprised at the number of architects who submitted schemes or models, for in the conclave of cardinals there must have been many conflicting opinions and interests, and the very fact of Bramante's design being in plan a Greek cross must have had many opponents, and at last the plan was made into a Latin cross.

Before Bramante died Fra Giocondo and Giuliano da Sangallo were given him as aids during his illness. He died in March, 1514. Raphael and Giuliano da Sangallo replaced Bramante at St. Peter's, but on July 1, 1515, Giuliano da Sangallo retired and Fra Giocondo died the same day. What Raphael did besides making the plan for a new scheme of basilica we know not, but he died in 1520, and a week before his death Antonio da Sangallo obtained the same remuneration that Raphael had, so we conclude he was made architect, for before he had only half the remuneration; and almost at the same date B. Peruzzi was made architect. I judge that the Italians always had two architects to their important buildings. In 1527 Rome was sacked by the followers of the Bourbon; after these had withdrawn Peruzzi returned to his office at St. Peter's in 1535, and remained in it till his death in 1536, and was buried in the Pantheon, and the place was then, I suppose, given to Antonio da Sangallo alone. According to Baron de Geymüller's plan, little else was done by Antonio than to strengthen the main piers under the dome, and a few other trifling additions and alterations, but beyond that he made several designs for a St. Peter's quite different from that of Bramante, and his wooden model is still in the model-room at St. Peter's.

Antonio da Sangallo was born in 1485 and died in 1546. On January 1, 1547, Paul III. conferred on Michelangelo the office of architect to St. Peter's for life, and Michelangelo then took in hand Bramante's modified design. Peruzzi before him had found Bramante's plan too expensive to be carried out and had suggested something smaller, but when Michelangelo became architect he always stated that any alteration from Bramante's plan would be a mistake; and we see from Baron Geymüller's plan that Michelangelo intended to leave the building as a square with a portico in front. Pirro Ligorio and Jacopo Barozzi da Vignola were made executors of Michelangelo's work, but P. Ligorio was dismissed for wanting to alter, and Vignola is said to have designed the small cupolas. Michelangelo died in 1564, having completed the drum of the dome, and Giacomo della Porta was appointed architect by Pope Sixtus V., with Domenico Fontana as his assistant about 1583; he is said to have finished the lantern in 1590. Fontana it was who raised the obelisk from the circus of Caligula and erected it in front of St. Peter's in 1586; and he died in 1607.

The finishing of St. Peter's, having been put up to a public architectural competition, was gained by Carlo Maderno, who was appointed architect November 5, 1607. The narthex was roofed in on December 12, 1614. By Maderno's converting of Bramante's design from a Greek into a Latin cross, the beauty of the dome is quite lost from a front view.

Giovanni Lorenzo Bernini, sculptor, painter, and architect, was born at the end of 1598, and at an early age showed remarkable talent for sculpture, so much so that Pope Paul V. is reported to have said to Cardinal Barberino, "Let us hope that this young fellow may become the Michelangelo of his age," and afterwards Anibal Caracci made a somewhat similar remark. When Cardinal Maffeo Barberino was made Pope Urban VIII., he had Bernini brought to him and said, "It is your good fortune, O Cavaliere, to see the Cardinal Maffeo Barberino Pope; but our fortune is much greater, that the Cavaliere Bernini should live in our pontificate." Shortly after his election he ordered Bernini to make the high altar and baldachino. A great deal of the bronze from which it was cast was from the bronze casing of the bressummers of the portico of the Pantheon. These bronze casings are shown in one of the sixteenth-century books, but which one I have forgotten. Bernini did some trifling work besides in St. Peter's, and, I think, put up the front bell-towers, now taken down, and built the celebrated staircase to the Vatican at the side of St. Peter's. I never saw any of Bernini's paintings, but his sculpture made quite an epoch in Europe. He executed one statue of Charles I. from the portraits by Vandyck which were sent out to him.

Most of the philosophers whose works I have read boldly take it for granted that mankind at all epochs have the same capacity, and it is difficult to prove that this is not the case, although we can be certain that in some cases the classes who once furnished the highest intelligences have deteriorated and can no longer furnish them, and there can be no doubt that the capacity shown in the Fine Arts is sometimes, or in some epochs, greatly superior to that of others. We know that the capacity of the Greeks just after their successful struggle against Persia was superior to that ever after evinced; and that in the Golden Epoch of the First Empire the Roman architectural monuments were superior to those of the Silver Age, if we except the Pantheon. At

the third great epoch, the Middle Ages, the Romanesque, though very impressive, was perhaps inferior in some respects to the finest specimens of Gothic when fully evolved; at any rate the Gothic was a complete system of a new art of vaulting and buttressing, and the piercing of all parts only wanted for stiffening; but it never attained the dignity and impressiveness of the Norman Romanesque; witness the nave and choir of Southwell.

At the Renaissance in Italy there was a delicacy and grace about its first development which gradually disappeared, and formalism prevailed and eventually gave place to contortion.

In 1414, thirty years before Brunelleschi died, the codex of Vitruvius was found at St. Gall by Poggio, and between 1480 and 1490 the "Editio Princeps" of Vitruvius was printed and published at Rome. The architects and artists, when they became conversant with Vitruvius, supposed that they had got a book which would enable them to rival the best works of the Romans, and a stricter adhesion to his rules was almost universally followed.

We know that Alfonso the Wise told Panormita (Beccadelli(that he would build the Castel Nuovo of Naples from Vitruvius alone, and that mighty genius Michelangelo seemed to favour the view that everything that Vitruvius said was perfect and applicable, and though Michelangelo's genius enabled him to produce sublime works, such as the tomb of the Medici, even this is full of glaring inconsistencies. But nothing that Michelangelo ever did had that grace and sweetness which so distinguished Bramante. As Michelangelo studied Bramante's designs he became more and more convinced that his scheme was the right one, and professed merely to carry out Bramante's design; but it was impossible for a man of his originality and power to carry out the work of another man of a genius entirely different, even if the size of it had not been too large for its cost to be defrayed when the resources of the Papacy were diminished after the Reformation. But the dome of St. Peter's, for which he left a model, is, I think, the most graceful dome I have seen. When I was in Rome as a student I frequently had to return on foot from San Lorenzo outside the walls. It was just as the sun was setting, and then before my eyes I had this graceful outline of the drum, dome, and lantern before me, fringed with the golden red of the setting sun; and whatever may be said about St. Peter's in regard to the indifferent taste displayed in details, the dome not only grows upon the visitor, but is looked upon by foreign artists who have lived for many years in Rome as one of the finest things in the world; and we must recollect that the size, the colossal proportions, and the solidity of the building must always impress mankind, even if it were a ruin. The ruins of the great baths at Rome, although stripped of their statues, precious marbles, columns, ornamental carving, and bronze, impress everybody that goes into them with a sense of their sublimity; and though we may wish that a purer and finer architectural sense might have been possessed by the architects and by the educated public when St. Peter's was completed, it is still one of the most impressive buildings of modern times.

A SENSATIONAL GAS SCHEME.

AN attempt is to be made during the next session of Parliament to pass a Bill to sanction the formation of a company with power to supply gas to a number of Midland towns at a maximum charge of 4d. per 1,000 cubic feet, or in the case of a consumer using not less than 4,000,000 cubic feet per quarter, at a maximum price of 3d. per 1,000 cubic feet. This Bill is known as the Mond Gas Bill, and the gas which it is proposed to supply is Mond or similar low-grade gas, which may be sold for all purposes except for illumination. The district to be supplied is a large one, including Smethwick, Walsall, West Bromwich, Wolverhampton, and several other neighbouring towns, but the Company does not ask for a monopoly of the power to supply this area with fuel gas.

The apparently extraordinary propositions contained in this Bill have evoked some amusing comments in the popular Press, in which the proposed prices have been compared with the existing charges for illuminating gas, without regard to the fact that Mond gas is of only one-fourth the value of coal gas for heating or motive-power purposes, and would require service pipes of four times the usual capacity if supplied at the same pressure.

Mond gas is a description of "producer-gas" produced with the aid of an unusually large quantity of steam, and a characteristic feature of the process is the manufacture of a large quantity of ammonium sulphate as a by-product, the sale of which is to cover the cost of the coal slack required for the production of the gas.

Roughly speaking, the illuminating gas supplied in London costs 1s. per 1,000 cubic ft. to manufacture, and another 1s. per 1,000 cubic ft. to distribute to the consumers. It is therefore difficult to conceive that fuel gas can be profitably distributed in comparatively small quantities at 4d. per 1,000 cubic ft. (The company may refuse to supply any consumer requiring less than 1,000,000 cubic ft. per quarter.) The supply at 3d. per 1,000 cubic ft. to consumers taking not less than 16,000,000 cubic ft. per annum is perhaps more feasible, because the plant required for the production of the gas does not occupy a large area of ground, and it might be expedient to erect a special plant in close proximity to the premises undertaking to consume so large a volume of gas. Distribution charges might thus be reduced to a minimum. This, however, is not the method of distribution at present contemplated.

The distribution of cheap fuel gas has, we believe, been attempted in the United States, but has not proved a commercial success. The district which the present scheme proposes to supply undoubtedly comprises an excellent field for an enterprise of this description, but it is exceedingly doubtful whether a dividend could ever be earned with gas selling at the prices quoted; and the Bill will, of course, meet with great opposition from those who already supply these districts with illuminating gas, which is very largely used for fuel purposes. Difficulty would also probably be experienced in preventing consumers from using the gas for illuminating purposes. The attempt is, however, a step in the right direction, for gaseous fuel can be more economically consumed than solid hydrocarbon mixtures of varying composition, such as coal. Already fully half of the enormous output of illuminating gas from the London gasworks is used for purposes for which non-luminous gas of the same heating power would be equally serviceable; and as several processes are now known by which non-luminous water gas possessing half the heating value of 16-candle coal gas can be manufactured at considerably less than half the cost, the question is being asked in many directions as to whether the time has not arrived when the gas companies should be requested to supply a cheap non-luminous gas in the place of the expensive illuminating gas at present supplied.

In view of the extreme importance of the calorific power of the public gas supply to London consumers, who drive many thousands of engines with it and use it for cooking in most of the numerous restaurants and hotels, it is remarkable that the London County Council has not, so far as we are aware, given any attention to this matter. This is the more strange, since it is a matter of public knowledge that the composition of the gas supplied has, during the last five years, been undergoing a change owing to the ever-increasing proportion of carburetted water gas added. Ceaseless watch, it is true, is maintained by the Council upon the illuminating power of the gas, but two gaseous mixtures of equal illuminating value may possess very different heating values. We do not know with what degree of success non-luminous producer gas can be used with the incandescent gaslight system or with the "albo-carbon" system, but any difficulties which may exist cannot be insuperable. High-grade water gas, such as that made by the Dellwik-Fleischer process, could, we believe, be used with either system as an illuminating agent.

It is unfortunate that any radical change in the character of the gas supplied necessitates a change in all the gas-burners employed. We have already drawn attention to the fact that the South Metropolitan Gas Company will reduce the quality of its gas from 16-candle power to 15-candle power after June 30 next, and subsequently to 14-candle power, and that one of the conditions upon which this reduction to 14-candles is to be permitted is that the company will exchange old burners for new burners better adapted to consume the poorer gas free of charge. Similarly, if non-luminous gas were substituted for illuminating gas, all the present burners would have to be discarded; but if the change is to be made, it may be better to make it in one stage than in a number of gradations.

The great demand for gas for the generation of electricity, for driving engines employed for all kinds of industrial work, for cooking and heating, and for incandescent gas lighting, has to so large an extent changed the standard of quality from the consumer's point of view from one of illuminating power to one of heating power, that we anticipate a radical change during the next decade in the tend of gas legislation, accompanied by a remarkable increase in the volume of gas manufactured. An indication of the quantity of gas that will be required when gas becomes universally employed as a source of motive power is given in a paper recently communicated to the Institution of Mechanical Engineers by Mr. Humphrey.* He stated that at the works of Brunner, Mond, & Co., at Winnington, Cheshire, a million cubic feet of gas are consumed per hour. An arithmetician might find interesting employment in calculating from this figure the quantity of gas that would be required to drive all the dynamos and stationary engines in the country, and, adding to the sum thereby obtained, the volume of gas consumed by a few hundred thousand gas fires and cookers. The resulting figure would serve as a rough estimate of the volume of gas which would be required to meet the public demand if Mond gas could be supplied in all our large towns to all classes of consumers at a maximum charge of 4d. per thousand cubic feet. It has often been suggested that two qualities of gas should be supplied, one for lighting purposes and one for fuel; but in most towns this is impracticable, owing partly to lack of road space, and it is probable that the consumers would speedily find some way of utilising the fuel gas for illuminating purposes at a cheaper rate than they could use the illuminating gas, and the supply of the latter would become unprofitable.

The Mond scheme, if sanctioned by Parliament, might not, and probably would not, be a commercial success, for, among other incidents that would follow its adoption, there would probably occur a rapid rise in the price of slack and a fall in the value of sulphate of ammonia. But if it attracts renewed attention to the possibilities of obtaining motive power from a smokeless agent at a lower cost than it can be obtained from coal direct, the introduction of the Bill may prove of great benefit to the community in general.

COMPETITIONS.

CARDIFF BOROUGH ASYLUM.—The Cardiff Asylum Committee, at a meeting recently, arranged to meet Mr. E. G. Hine, the assessor in the competition among architects for designing the Cardiff Asylum to be built at Whitchurch. From a large number of competitive designs Mr. Hine selected five to send in complete drawings, and from these five he will make his award. The architects are Messrs. H. H. Wills and J. Anderson, Swansea; G. H. Cattey and W. S. Skinner, Bristol; Hooley & Sander, Nottingham; Law & Allen, Arundel-street, W.C.; and Greenaway & Newberry, Queen Anne's Gate, S.W.—*South Wales Daily News.*

WESLEYAN CHURCH, WESTERHOPE, NEWCASTLE-ON-TYNE.—The trustees of the proposed new Wesleyan Church at Westerhope have selected the designs, submitted in a limited competition, by Messrs. Marshall and Tweedy, architects, Newcastle. Their scheme is for a church to seat 500, with school hall, and a smaller hall to accommodate 100, vestries, and caretaker's house. The buildings are to be of stone.

ADDITIONS TO WESLEYAN SCHOOLS, PRESTON, LANCASHIRE.—Extensive additions and alterations have been made at St. Mary's-street Wesleyan Schools, Preston. Four classrooms have been added on the east side and four other classrooms have been extended. The increased accommodation is for 150 scholars. The new work is in stone, in conformity with the original building. The cost of the extensions has been about 2,700*l.* The work was designed by Councillor E. J. Andrew, and was executed by the following contractors:—Mr. Lucas, Preston, the masonry and joinery; Mr. Wooton, the plumbing and painting; and Mr. Nixon, the flagging and slating.

* See the *Builder*, December 22, 1900.

Bronze Memorial Tablet to be placed on the House, No. 27, Southampton-street, Strand, in which Garrick lived.

MEMORIAL TABLET TO DAVID GARRICK.

THE bronze tablet of which we give an illustration is to be placed on the wall of the house, No. 27, Southampton-street, Strand, where Garrick lived for twenty-two years.

The tablet is put up at the cost of the Duke of Bedford's estate. It is cast by Mr. Parlanti from a model prepared by Mr. H. C. Fehr, the sculptor, after a sketch by Mr. C. Fitzroy Doll, architect. The figures are supposed to be those of Melpomene and Thalia, the muses of Tragedy and Comedy. The portrait medallion was made after a study from an existing picture, and the dates on the tablet were obtained from the Parish Register of St. Paul's, Covent Garden. We may congratulate all concerned on having produced a memorial tablet of more artistic character and interest than most of those which have been affixed to historic houses in London.

ELECTRIC LIGHT, &c., HARROGATE.—Colonel A. G. Durnford, R.E., held an inquiry in the Council Chamber, Harrogate, on the 16th ult., respecting an application to borrow 10,000*l.* for electric light purposes and 1,000*l.* for sewerage purposes. As regards the electric light, the loan is required principally for generating plant. Mr. G. Wilkinson (Electrical Engineer) explained the scheme, and Mr. Bagshaw (Surveyor) the plans, &c. The loan of 1,000*l.* is to enable the Corporation to construct a sewer from the Grove Park Estate to take the sewage from that district to the sewage farm at Bilton.

WESLEYAN MISSION HALL, BILSTON, STAFFORDSHIRE.—A Wesleyan mission hall has been erected in Temple-street, Bilston, at a cost of 1,300*l.* Mr. H. Walker, of Wealdston, was the architect, and Messrs. Morrell Brothers, of Bilston, were the builders.

MAGAZINES AND REVIEWS.

THE *Art Journal* contains an article on "Decorative Flower Studies," with illustrations from drawings by Miss Foord, which we presume are intended not as decorative designs but as examples of the study of flower-forms with a view to their subsequent use in decoration. Drawings made with this object will probably be, and should be, different from those made with the view to a pictorial treatment of flowers. Miss Foord's studies are good examples of careful analysis of flower-forms with the pencil. Mr. Walter Armstrong contributes an article on "Early Italian Portraits," with illustrations from Ghirlandajo, Ambrogio de Predis, and Lorenzo di Credi. Mr. Maccoll contributes a short article to accompany an engraving of Rodin's "John the Baptist," which it is proposed to purchase by subscription for the nation. The article contains the extravagant praise of Rodin which is fashionable at present, but we do not see how a figure which is quite finished and has all its limbs complete can properly be accepted as a typical work of the Rodin of the present day. *Au reste*, it is a fine work, but we think a nude John the Baptist is a mistake; no one can ever think of John the Baptist without his "raiment of camel's hair." The frank nudity of the "Age d'Airain," Rodin's best work, was quite right; but a nude John the Baptist is out of keeping. Mr. Cosmo Monkhouses's article on the Charles I. statue at Charing Cross is really interesting, and among other things contains illustrations of two designs by Wren for the monument, which one may be thankful were not carried out.

The *Studio* (January 15) opens with an article on Manet, whose works appear much better in black and white illustration than in their orginal often repellent, crude, and violent colour. The article is by M. Antonin Proust (translated we presume), and is marked by the usual indiscriminating adulation of Manet's friends and partisans; indeed, one may say there is hardly any such thing as "art-criticism" now, in the true sense of the word; what is so called consisting simply in picking out certain artists for worship, and praising indiscriminately all that they have done. M. Proust says that "it was reserved for Manet to revive the healthy national tradition — the love of the rare and unrecognised." That is precisely what we should call an unhealthy tradition. A remark of Manet's own at the close of his life is quoted—"you know, my work must be seen in its entirety. If I should vanish, I beg you not to let me go bit by bit into the public collections, for people would judge me ill." There is truth and perception in that. When Manet's works are seen collectively, one can at least see what he was aiming at. But he is an artist not at the centre of art. The number contains an attempt—hardly wise—to represent in chromolithograph Didier-Pouget's great picture "Gargilesse," at the last year's Salon; it would have been better to have given a reproduction in black and white, the attempt at an imitation in colour can never be successful except with a very conventional class of landscape-painting. The illustration (with some others) accompanies an article on Didier-Pouget's work, from which we are glad to learn that this fine landscape artist is still a comparatively young man. The number includes a short article by Mr. C. F. A. Voysey on "Domestic Entrance Halls," which, for houses of the better class, strike us as too domestic; it seems to be the new idea to make the interior of an ordinary-sized gentleman's

house as like a cottage as possible, a treatment at variance with the true fitness of things. Plans of two houses are given, but we observe that Mr. Voysey, like the architectural students at the Royal Academy, omits the compass point from his house plans.

The *Magazine of Art* contains an article on the work of Sir W. Richmond, and one by Mr. Spielmann on Louis Morin, who may be said to be a humorous artist dealing mainly with eighteenth-century subjects and figures. There is a rare talent in some of the designs illustrated.

The *Artist* has, under the title "A Minor Tuscan Town," an article on San Gimignano, with sketches of the celebrated towers, all that remain to us of the "flock of steeples" (in Browning's phrase) which used to be the characteristic of the Italian mediæval town.

The *Quarry* has a special article on "The Petrography of Building Stone;" defining "petrography" as "the science which treats of the mineral composition and minute structure of rocks."

The *Gentleman's Magazine* is a good number, but none of the articles come within our province to notice.

The *Architectural Record* (New York) contains under the heading of "Leading French Architects" an article on the works of M. Bouvard, who was architect-in-chief for the 1900 Exhibition, and whose executed works give proof of a remarkable versatility, practical planning and temporary decorative art-palaces appearing to be equally within his grasp. Among the best of the permanent buildings illustrated is his façade for the building erected as the "Bourse de Travail," a scheme which, if we remember right, failed of its social and commercial objects. His central dome for the 1889 Exhibition is recalled by an illustration here, and is so harmonious in its general lines that one cannot but regret that it was not erected as a permanent building shorn of some of its gaudy accompaniments. The new capitol of St. Paul, Minnesota, is illustrated by a perspective from a drawing by the architect (Mr. Cass Gilbert); a rather weak building with a gracefully treated central dome. The plan is not given, but we have several of the sculptured figures (of Virtues, &c.), by Mr. Daniel C. French, which we must say remind us a good deal of Mr. Dodd's allegorical group, described in Stevenson's "The Wrecker," of which the Parisian sculptor under whom he had worked, being told it was for a kind of Prefecture, at first replied "Qu'est-ce que vous me chantez là"? but on learning it was for the States, added "Ah—en Amérique; ver' goot, ver' goot!" If the Americans have assimilated French architecture very successfully, they are certainly a long way as yet from French sculpture. Among the works of recent American architecture, illustrated from some photographs, is a stable in 78th Street, New York, which as an architectural treatment of that class of building is worth attention. An article on "American Artists and their Public," by Mr. Herbert Croley, is interesting as an appreciation of the position by an American, and the following passage is worth quoting:—

"While Americans are very much interested in works of art, they have little instinctive love either of the work or the art, and the writer—who, in this respect, and I hope in many others, is a good average American — can discern the plain and sufficient reason. What we want is art with associations and a background. The popularity of the recent decorations is not in the least a tribute to the intrinsic merit of the painting; it depends almost entirely on interesting accessories. The Congressional Library is thronged with visitors, because the place in which the decorations are situated impresses the patriotic imagination of the American people. They must be worth seeing, because they are in the Congressional Library; and everybody says they are worth seeing. Once the civic order has formally approved them, they have obtained an importance beyond the power of mere paint. So it is with the popular interest in art history. We make a great to-do about Phidias, Amiens, and Giotto. If we are a woman, we read essays on them to the members of our favourite club. We study them, we translate them into prose, we use them as educational influences, we find in them a source of spiritual illumination; but, I make bold to say, we very seldom genuinely enjoy them. We have not taken to them because of an actual and innocent love of beautiful things, but because the Garden of Art has been recommended to us as a serviceable training and tilting ground for our moral aspirations."

He adds, what we have no doubt is true, that the best American artists do not at all approve this attitude in regard to art, and find in it one of their great stumbling-blocks both to progress and to appreciation.

The *Architectural Review* (Boston) gives among the illustrations to its latest issue a fine competition design for the new Union Club at New York, by Mr. Donn Barber; a design showing in its architectural treatment all the proper characteristics of club architecture. Mr. E. R. Smith's essay on architectural classics (books) is continued, and deals in this issue with French architectural writers, with a number of curious illustrations reduced from the pages of Du Cerceau, Le Pautre, and others.

The *Edinburgh Review* contains an article on "Landscape: Symbolic, Imaginative, and Actual," tracing the change from ideas of landscape with the ancients, with whom external nature was always the symbol of something in the mind or the destiny of man, to the modern view of landscape as a concrete fact or phenomenon. The article is concerned, naturally, with conceptions and descriptions of landscape in poetry as well as with its representation in art. The *Review* contains a well-written and judicious article on Velasquez—a review of several books of art history and art-criticism, pervaded, however, by some of that over-adulation of this great but seldom beautiful artist, which is the attitude of the modern art-critic.

The *Quarterly Review*, a very good number, contains, however, nothing that is within our province to comment on; one article is on the subject of "The Nicaraguan Canal," but it is purely political, and no question of engineering enters into it.

Scribner contains an interesting and picturesque article on "Carcassonne" and "Albi," with illustrations by the author, Mr. E. C. Peixotto. Under "The Field of Art" is an article by Mr. P. B. Wight on the question, which had been discussed at an architectural symposium at Chicago, "Can architecture again become a living art?" The direction suggested for the answer to the question may be best indicated by quoting the concluding paragraphs:—

"The modern independent designer spurns the thought of copying anything his neighbour has done, though he may be willing to use the same ancient model; and he indignantly protests if anything he does is copied. Evolution in architecture is impossible in such a case. It is only possible when every one copies the best work of his neighbour, and adds something to it of his own; and his neighbour thanks him for so doing, and goes and does likewise.

If we should take the models of Roman architecture for our starting-point, and recognis and freely adopt all the materials and methods of construction that we now have, we would in time evolve a new architecture which would differ little from what we might get if we started with Byzantine or Gothic, provided all the architects adhered to the precept contained in the last sentence. So from whatever point of view we regard the question, 'Can architecture again become a living art?' it will always be found that the first essential is that the architect shall drop his individuality. It is in this respect that the profession of the architect differs from that of the painter, the sculptor, or any other artist."

The conclusion is the same at which one or two able English architects have arrived; though others, again, are as strongly opposed to it. It seems to us that there is a great deal of truth in Mr. Wight's view.

The *Pall Mall Magazine* has secured a posthumous article by Charles Yriarte on "The Rise of the Romantic School in France," as represented by the works of such men as Géricault and Delacroix, followed by Diaz, Rousseau, Corot, Couture, Barye, &c., while Rude's fine relief on the Arc de l'Etoile is taken as representing the romantic movement in sculpture. The article, though short and concentrated, contains much interesting critical suggestion in regard to the period of French art treated of.

Harper contains a somewhat over-enthusiastic article by Mr. S. Whitman on the works of Franz von Lenbach, the German portrait-painter, with illustrations from his portraits of Bismarck, the present Pope, and Gladstone; all of them, we fully agree, highly characteristic portraits. Mr. Paul Meurice's article on "Victor Hugo as an Artist" is continued; but these semi-grotesque efforts of Hugo's are certainly not worth all the fuss here made about them.

The *Fortnightly Review* list of contents is headed by the rather surprising announcement of an article on "Railway Reform in Great Britain," by Mr. Rudyard Kipling. This however turns out not to be the usual style of statistic article, but a most delightful and humorous treatment of the subject in a kind of Oriental parable, or parallel. Every one should read it, whether they care about railway reform or not. The general moral of it is that competition is the means to keep railways up to the mark, and that monopoly of a route or country tends to a sleepy and slack administration.

The *Berlin Architektur-Welt* gives an article with a number of illustrations on the competition designs for a new church at Zehlendorf, which illustrate both the wiry character of Gothic favoured in modern German church architecture, and the ingenuity and variety in planning which often accompanies it. The design by Herr Kickton, of Potsdam, for a brick church on a stone base, is the best and most interesting in architectural treatment. There are some interesting examples of modern villa residences by various architects.

The *Century* has a short article by Mr. R. H. Thurston, Director of Sibley College, Cornell, on "The Steel Industry of America." It is mainly statistical in regard to the present stage of this immense industry in America. Under "Open Letters" is an appreciation, or rather depreciation, of Landseer, which is rather too pessimist, though it is quite true that Landseer's success was not a purely artistic one.

Knowledge has an interesting illustrated article on "Constellation Figures as Greek Coin Types."

The *Church Builder*, the quarterly record of the work of the Church Building Society, gives the statistics of work of the past quarter, together with a historical sketch of the Rural Deanery of Woolwich, with sketches of the curious interior of Woolwich Parish Church, and of two of the new churches—St. Mark's, Plumstead, which we illustrated recently, and St. Paul's, Plumstead.

The editor of *Architectural Association Notes* has had the happy idea of asking all the former presidents who are living to write their New Century greetings to the Association; this has resulted in the collection of nineteen short letters expressing good wishes with suggestions for the best course for architecture at the present moment, which are of considerable interest.

WATER COMPANIES' REGULATIONS.

A CONFERENCE convened by the London County Council of the representatives of the City Corporation, the City of Westminster, and the Councils of the Metropolitan Boroughs, was held at the County Hall, Spring-gardens, on Monday, to consider the proposed amended regulations of the Metropolitan Water Companies.

Alderman Dickinson, Chairman of the London County Council, presided, and in opening the proceedings said that the County Council would deal with the matter at their meeting the following day, and the following Monday the Local Government Board inquiry on the subject would be held. He welcomed the representatives, and he thought there could be no matter of more common concern to Londoners than the one they had before them that day. Even from the point of view of £ s. d. the proposed regulations, should they become law, would affect almost every householder in London, and a great deal of expense would be forced upon inhabitants. The Council had tried to ascertain roughly what that expense would be. They had taken a house of the rateable value of 45*l.*, and it had been found that it would cost 53*l.* to the householder to carry out the regulations proposed. Another house the rateable value of 250*l.*, which was already provided with a cistern of the size and kind required, would require 85*l.* to be expended upon it, and, but for the cistern, 40*l.* more would be required. But perhaps the most striking instance of all related to a block of artisans dwellings now being erected. They had compared the cost of the water fittings of those dwellings under present regulations and under the proposed regulations, and they found that under the old regulations the cost of the fittings would be 60*l.*, while under the new regulations it would be 125*l.* If that sort of thing was to affect all the houses of London, as no doubt it would to a great extent, the situation was one of very great seriousness. There was no doubt that the proposed regulations had evoked the hostility of all the Borough Councils as well as the County Council. In 1872 an inquiry was held into

certain regulations of the companies in regard to fittings; that inquiry lasted a very considerable time, cost a large amount of public money, and was ultimately settled by a system of regulations under which the companies had carried on their business for the last thirty years. Those regulations had been to a very great extent perfectly satisfactory. The Royal Commission which sat last year pointed out that it had been stated to them that the system of examination of fittings of various houses was not satisfactory, and they had had brought to their notice the fact, which had been known for years, that there was an enormous amount of waste of water going on in London, though they did not sufficiently inquire into who was responsible for that waste. That waste did occur—that a large amount of water was unnecessarily used daily in London, was an undoubted fact, but whether it was the fault of the consumer or of the companies was a moot point, and for his part he thought, to a large extent, it rested with the companies, who had not properly carried out the powers they possessed. Taking the figures for last July he found that the Kent Company supplied at the rate of 36 gallons per head per day, whereas the Grand Junction Company could not do its business with less than 56 gallons per head per day; and between those extremes the other companies varied. But the conditions of London were not dissimilar, and if the Kent Company, and the New River Company, and the East London Company could give a satisfactory supply with about 36 gallons, it was evident that something must be wrong with the company which required 56 gallons per head per day. The amount of water which was lost by the differences between the companies was remarkable: the amount supplied last July was 247 million gallons daily, but if all the companies had carried out their undertakings as the Kent Company did, the amount would have been only 222 million gallons, or a saving of 25 million gallons per day. That was the question to which the water companies ought to apply themselves before they sought the extraordinary powers they were now asking for over the construction and management of the private houses of London. But even if a re-arrangement of the regulations of the companies was necessary, it was a grave question whether it was expedient at the present time, because the water question in London had assumed a very different complexion from that which it had in 1872. A Royal Commission had reported in favour of purchase by some public authority and there could be little doubt that the Government would take up the question of purchase before long. It was only under the heading in the report of the Royal Commission of what would be necessary if purchase did not take place that the proposals for increased and more efficient regulations came. There was no doubt that in a few years purchase would take place, and the only effect of proposed regulations would be to place the companies in a much better position before the arbitrator who would fix the price when the question of purchase arose. Some of the companies were very near the end of their resources, and if these regulations were agreed to their power would be extended and their position, from a financial point of view, greatly improved. But the position was serious. The companies had applied for those regulations to be made. He did not know that the Local Government Board had any power to refuse to consider the question. The matter would have to come up, and he could only rejoice at that day's demonstration, which showed that the representatives of Londoners, as a whole, would do their best to protect the interests of Londoners as a whole. The County Council would consider the matter the following day in the form of a joint report of the Water and Public Health Committees, and he would suggest that the conference should consider the recommendations of the joint committee on each of the proposed regulations of the companies.

After some discussion as to procedure, the Chairman's proposal was agreed to.

Mr. T. McKinnon Wood, Chairman of the Water Committee of the Council, moved: "That the Local Government Board be requested to adjourn the inquiry, seeing that the Government has intimated its intention of introducing a Bill in 1902 dealing with the water question." That, he thought, would strike at the root of the matter, besides leaving the Conference free to deal with the proposed regulations.

Mr. Shaw Lefevre seconded, remarking that it was monstrous that the regulations should be brought forward now, seeing that the Royal Commission had recommended purchase. An inquiry at the present time was a waste of public time and money.

Mr. Morton said that in the City they had decided to go to the Local Government Board for permission to use automatic cisterns and three-gallon flush cisterns. The regulations, if agreed to, would give the companies a great deal of power to interfere with property.

Mr. Wood's motion was then agreed to.

The first amended regulation proposed by the companies is as follows:—

1. *Place of communication-pipe.*—No "communication-pipe" for the conveyance of water from the waterworks of the company into any premises shall hereafter be laid [until after the point or place at which such "communication-pipe" is proposed to be] *or* brought into such premises [shall have had the approval of] *except at the place previously approved by* the company.*

To this the Joint Committee of the Council recommended, and the Conference agreed, that Regulation No. 1 should be struck out, and the old regulation substituted. It was also agreed to add the following suggestion of a conference of Borough Councils south of the Thames and the Wandsworth Borough Council:—

Add "and in the event of the company not consenting to the position of a 'communication-pipe' as suggested by an applicant, there shall be an appeal to the Borough Council, whose decision shall be final."

The second of the proposed regulations of the companies is as follows:—

2. *Definition of "communication pipe."*—In these regulations the term "communication pipe" shall mean the pipe which extends from the district pipe, or other supply pipe of the company, up to the "[stop] *ball* valve," prescribed in the Regulation No. 24, *and any pipe of the consumer subject to pressure from the company's main.**

On this the Joint Committee recommended, and the Conference agreed, to oppose the proposed extension of the definition of "communication pipe."

The third proposal of the companies is as follows:—

3. *Not more than one communication pipe to each house.*—No house shall, unless with the permission of the company *given* in writing, *under the hand of their secretary*, be hereafter fitted with more than one "communication pipe."*

The Joint Committee of the Council proposed "That a proviso should be added to Regulation 3 to the effect that branches from a communication pipe shall not be deemed to be separate communication pipes."

This gave rise to some discussion. It was agreed to strike out the words "under the hand of their secretary"; and it was also agreed to add to the recommendation of the Joint Committee of the Council words to the effect that there should be an appeal to the local sanitary authority in the event of the refusal of the water companies.

The following proposals, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14 of the water companies, and the recommendations of the Joint Committee of the Council at the end of each, were then considered. The recommendations were agreed to by the Conference:—

4. *Every house, with certain exceptions, to have its own communication pipe.*—Every house supplied with water by the company (except in cases of stand pipes) shall have its own separate "communication pipe." Provided that, as far as is consistent with the special Acts of the company, in the case of a group or block of houses, the water rates of which are paid by one owner, the said owner may [at his option] *with the consent of the company in writing under the hand of their secretary*, have one sufficient "communication pipe" for such group or block *of houses, but each house so supplied shall be commanded, independently of any other house, by a stop valve, placed in a readily accessible position* *

[L.C.C. Committee and Conference:—"That regulation No. 4 should be struck out and the old regulation substituted."]

†5. *Defective communication pipe.*—Any existing "communication-pipe" which is not as prescribed by these Regulations shall, when it becomes defective, or requires repair, be replaced by a lead-pipe of the prescribed weight.

[L.C.C. Committee and Conference:—"That Regulation No. 5 should be amended so as to provide that any existing communication pipe which is not as prescribed by the regulations shall when it becomes so defective as not to be watertight, be repaired or replaced by a pipe of similar material to the existing pipe, but of the prescribed weight for a new communication pipe; provided that the regulation shall not require the whole of the existing communication pipe to be replaced but only so much of the pipe as is not watertight and cannot be made so."]

6. *No house to have connexion with fittings of adjoining house.*—No house supplied with water by the company shall have any connexion with the pipes, *cisterns*, or other fittings of any other premises, except in the case of groups, or blocks of houses, referred to in the [preceding] Regulation *No. 4.**

[The L.C.C. Committee and the Conference had no observations to make on this regulation.]

7. *Connexion to be by ferrule.*—The connexion of every "communication pipe" with any pipe of the company shall hereafter be made by means of a sound and suitable brass screwed ferrule or stop-cock with union, and such ferrule or stop-cock shall be *of a pattern approved by the company and shall be* so made as to have a clear area of waterway equal to that of a half-inch pipe. The connexion of every "communication pipe" with the pipes of the company shall be made by the company's workmen, and the company shall be paid in advance the reasonable costs and charges of, and incident to, the making of such connexion.*

[Joint Committee and Conference:—"(*a*) That the words in italics should be omitted.

(*b*) That regulation No. 7 should be amended so as to provide that the company shall provide, fix, and maintain at their own expense the fittings and piping necessary to supply the water up to the premises, including the stop-cock."]

†8. *Weights and dimensions of ferrules.*—Every ferrule shall be of not less than the following dimensions:—[Here follows an elaborate table which we have not space to print.—ED.].*

[The Committee and Conference had no recommendations to make.]

9. *Materials and joints of external pipes.*—Every "communication pipe" and every pipe external to the house and through the external walls thereof [hereafter] respectively laid or fixed, in connexion with the water of the company, shall be of lead; *all such pipes shall be properly protected to the satisfaction of the company against frost, theft, or mischief*, and every joint thereof shall be of the kind called a "plumbing" or "wiped" joint.*

[Joint Committee and Conference:—"(*a*) That the word 'hereafter' should be retained in line 2 of regulation No. 9.

(*b*) That the words 'external to the house' should be inserted after the word '*pipes*' in line 3 of regulation No. 9.

(*c*) That the words 'to the satisfaction of the company' should be omitted, and that words should be added to regulation No. 9 to the effect that in case of dispute between the company and the owner or occupier as to whether the pipes are properly protected against frost, theft, or mischief, the matter shall be decided by the Borough Council."]

10. *Material, joints, and position of internal pipes.*—Every pipe hereafter laid or fixed [in the interior of any dwelling-house] for the conveyance of, or in connexion with, the water of the company [must, unless with the consent of the company] *shall*, if in contact with the ground, *or under the flooring or not visible*, be of lead, but may otherwise be of lead, copper, or wrought iron *lap welded steam tube* at the option of the consumer; *and every joint on lead pipe shall be of the kind called a "plumbing" or "wiped" joint. All pipes inside any building shall be accessible, and not be embedded in the plaster, stone, or brickwork of any wall, or placed behind match lining.**

[Joint Committee and Conference:—"(*a*) That the words 'or under the flooring, or not visible,' should be omitted.

(*b*) That the words 'to be hereafter erected' should be inserted after 'all pipes inside any building.'

(*c*) That the words 'or placed behind match lining' should be omitted, and that a proviso should be added to the regulation to the effect that it shall not be deemed to prevent pipes from being placed in properly formed chases, or behind movable casings."]

11. *Weight of lead pipes.*—No lead pipe shall hereafter be laid or fixed in or about any premises for the conveyance of, or in connexion with, the water supplied by the company (except when, and as otherwise authorised by these regulations, or by the company), unless the same shall be *sound of good metal, and* of equal thickness throughout, and of at least the weight following, that is to say:—

Internal diameter of pipe in inches.	Weight of pipe in lbs. per lineal yard.
⅜-inch diameter.	5 lbs. per lineal yard
½ " "	6 " "
⅝ " "	7½ " "
¾ " "	9 " "
1 " "	[12] *16* lbs. "
1¼ " "	[16] *22½* " "
(*New*) 1½ " "	*30* lbs. " *

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
† The whole of this regulation is new.

[Joint Committee and Conference :—"That the increase in the weight of lead pipes proposed in Regulation No. 11 be opposed."]

12. *Depth of Pipes Underground.*—Every pipe hereafter laid for the conveyance of, or in connexion with, water supplied by the company, shall, when [laid in open ground] *outside any building and underground*, be laid at least 2 ft. 6 in. below the surface, and shall in every exposed situation be properly protected *to the satisfaction of the company* against the effects of frost.*

[Joint Committee and Conference :—

(*a*) That the words "where the pipes of the company are of the same or greater depth" should be added after "surface."

(*b*) That the words "to the satisfaction of the company" should be omitted, and that words should be added to the regulation to the effect that, in case of dispute between the company and the owner or occupier as to whether the pipes are properly protected against the effects of frost, the matter shall be decided by the Borough Council.]

13. *No Pipe to be Laid through Drains, &c.*—No pipe shall be used for the conveyance of, or in connexion with, water supplied by the company, which is laid or fixed through, in, or into any drain, ashpit, sink, or manure hole, or through, in, or into any place where the water conveyed through such pipe may be liable to become fouled, except where such drain, ashpit, sink, or manure hole, or other such place shall be in the unavoidable course of such pipe, and then in every such case such pipe shall be passed through an exterior *water-tight* cast-iron pipe or jacket of sufficient length and strength, and of such construction as to afford due protection to the water-pipe.*

[Joint Committee and Conference:—"That Regulation No. 13 should be so amended as to prohibit persons from laying water pipes through drains, ashpits, sinks, or manure holes."]

14. *No Connexion with Rain-Water Receptacle.*—No pipe for the conveyance of, or in connexion with, water, supplied by the company, shall communicate with any cistern, butt, or other receptacle used or intended to be used, for rain-water, *or for any water not supplied by the company.**

[The Joint Committee and Conference had no recommendation to make.]

No. 15 of the companies proposed regulations is as follows :—

† 15. *Fittings to be Tested and Stamped.*—All water-fittings shall hereafter be made in accordance with the particulars, weights, and dimensions prescribed by these regulations, and, previously to being fitted or fixed upon any premises supplied with water by the company, shall be tested and bear the company's stamp of approval. All fittings which when in use will be subject to pressure shall be capable of resisting a force of 300 lbs. per square inch. Fittings submitted for the purpose of being tested and stamped shall in all cases be of a quality at least equal to samples approved by the company. The company may make a reasonable charge for testing any watter-fittings submitted to them for such purpose.

[The Joint Committee of the Council recommended that the regulation be opposed with a view to its being struck out of the regulations.]

The Conference agreed to this recommendation, with the addition of the following words as alternatives :—

"But, in the event of the opposition not being successful, that the regulations defining the weight and patterns of fittings be placed in the hands of a public authority, such as the London County Council, and that any fitting or appliance stamped by such authority may be used in any premises supplied with water by the metropolitan water companies.

Further that, if the water companies are to have the power to stamp fittings, they should do so without charge, and that the stamping should be a guarantee that the fitting is as described."

The following is Regulation 16 as proposed by the companies :—

16. *Waterway of Fittings.*—Except with the written consent of the consumer, no cock, ferrule, joint, union, valve, or other fitting, in the course of any "communication pipe," shall have a waterway of less area than that of the "communication pipe," so that the waterway from the water in the district pipe or other supply pipe of the company up to and through the stop-valve prescribed by Regulation No. 17 shall not in any part be of less area than that of the "communication pipe" itself, which pipe shall not be of less than ½-in. bore in all its course.*

The Joint Committee proposed, and the Conference agreed,—

"That the words 'hereafter provided' should be inserted after 'fitting' in line 3 of Regulation No. 16, and that the words 'Except with the written consent of the consumer' should be omitted."

The companies' next proposal is as follows :—

17. *Stop Valves.*—Every "communication pipe" for the conveyance of water to be supplied by the company into any premises shall have *outside such premises* at or near its point of entrance [into such premises, and if desired by the consumer within such premises] a sound and suitable stop-valve of the screw-down kind, with an area of waterway not less than that of ½-in. pipe, and not greater than that of the "communication pipe," the size of the valve within these limits being at the option of the consumer, *who shall also fix a second stop-valve inside the house or building.*

[Such] *Every* stop-valve [if] placed in the ground shall be protected by a proper cover and "guard box" *approved by the company, secured upon brickwork or other suitable setting.**

The Joint Committee recommended as follows :—

(*a*) "That regulation No. 17 should be amended by the insertion, after the word 'kind' in line 7, of the words 'such stop valve to be provided and maintained by the company at their own expense.'

(*b*) That all the words after 'communication pipe' in line 9 of regulation 17 should be omitted, and the following words substituted, 'The owner may at his option provide and fix a second stop-valve inside the house or building.'

(*c*) That the second paragraph of regulation No. 17 should be omitted as a consequence of the foregoing amendments."

The recommendations were agreed to by the Conference with the following addition :—

(*d*) "That the outside stop-valve should be as near as practicable abutting on the frontage of the premises, but where there is a forecourt it should in all cases be placed in such forecourt, and that in all cases of dispute as to its position, there shall be an appeal to the local sanitary authority, whose decision shall be final."

The following regulation as proposed by the companies is entirely new :—

18. *Weights and Dimensions of Stop-valves, Draw-taps and Bath Apparatus*—Every screw-down stop-valve, draw-tap and bath apparatus shall be fitted with loose valves (such valves shall be lifted by the spindle and shall not be dependent upon the pressure of the water for opening), and shall be fitted for cold water with washers of oil-dressed leather, and for hot water with washers of vegetable fibre of the best quality, or other material approved by the company. The word "inlet" shall be distinctly marked on the inlet side of the stop-valve, and such stop-valves for attachment to lead pipe shall be made with screwed ends and unions. The spindles shall in all cases be of gun metal, but all other parts may be of brass of good suitable quality. Every stop-valve, draw-tap, and bath apparatus shall be of not less than the following weights and dimensions :—[Here follows an elaborate table which we have not space to print.—ED.]

The Joint Committee recommended :

(*a*) "That the words 'which may hereafter be provided' should be inserted after the words 'apparatus' (line 3), 'valve' (line 11), and 'apparatus' (line 16), and that the words 'equally suitable material' should be substituted for 'material approved by the company' in line 9 of regulation No. 18.

(*b*) That the words ('such valves shall be lifted by the spinidle, and shall not be dependent upon the pressure of the water for opening') should be omitted.

These recommendations were agreed to, with the following addition :—

(*c*) "That the words 'waste arrangements of bath plates shall always be submitted for approval,' should be omitted from the table of weights and dimensions.

A long discussion took place on the following proposal :—

† 19. *Cold Water Storage Cisterns.*—Every house (or in case of flats each suite of rooms) supplied by the company shall, except with the consent of the company in writing, under the hand of their secretary, be provided with a cold water storage cistern or cisterns of sufficient capacity to contain in the aggregate at least 25 gallons of water for each room. Each outlet pipe from such cistern or cisterns shall be carried up inside 1 in. above the bottom of the cistern, and such outlet-pipe shall be commanded by an efficient screw-down stop-valve, placed in a readily accessible position, within 1 ft. of such cistern, and a draw-off tap from same shall be provided. In no case may there be any connexion between the draw-off pipe from the cistern and the supply or communication pipe.

The Joint Committee recommended that the regulation be opposed, with a view to its being struck out of the regulations, but one or two of the representatives expressed the belief that the Committee is in error in objecting to the use of cisterns. The following recommendation was moved by Mr. Councillor J. T. Clark and seconded by Mr. Councillor E. Gates :—

(*a*) "That this Conference, while agreeing that storage cisterns are necessary to ensure consumers against temporary stoppage of supply, and that such cisterns should be properly designed for storage of water, is of opinion that the character of such cisterns is a vital public health question upon which public opinion stands in much need of guidance, and suggests that the London County Council shall take such steps as it may deem expedient for holding a public competition of the various improved cisterns now in the market, and to make suitable awards of merit thereon."

The motion was defeated, and the recommendation of the Committee was agreed to by a large majority.

On the following proposals of the companies no recommendations were made by Committee or Conference :—

20. *Buried cisterns prohibited.*—No cistern buried or excavated in the ground shall be used for the storage or reception of water supplied by the company, unless the use of such cistern shall be allowed in writing by the company *under the hand of their secretary.**

21. *Wooden receptacles prohibited.*—No wooden receptacle without a proper metallic lining shall be [hereafter brought into use] *used* for the storage of any water supplied by the company.*

The following are the amended regulations proposed by the companies from 22 to 33 inclusive, with the recommendations of the Committee in brackets, which recommendations were agreed to by the Conference :—

22. *Character of Cisterns.*—Every cistern used in connexion with the water supplied by the company shall be made, and at all times maintained, water-tight, and be properly covered *with a close-fitting lid*, and placed in such a position that it may be *readily* inspected and cleansed.*

[That the words in italics be omitted.]

† 23. *Protection of Cisterns.*—Every cistern hereafter fixed in connexion with water supplied by the company shall, except with the consent of the company, be placed within the house or building, and shall have a clear space of not less than two feet between its top, measured from the centre, and any ceiling, rafter, or roof, and any cistern hereafter fixed in an exposed position shall be bricked around or otherwise properly protected, to the satisfaction of the company, against frost, theft, or mischief.

[That the regulation be opposed, with a view to its being struck out of the regulations.

24. *Ball Valves.*—Every [such existing] cistern *shall be* [if not already] provided, *and kept provided*, with [an efficient "ball-tap," and every such future cistern shall be provided with a sound and suitable "ball-tap" of the valve kind for the inlet of water] *a sound and suitable "ball-valve" securely branched into the inlet pipe (which must be firmly fixed) and so set that the ball will not become submerged or allow the water to arise within two inches of the lower side of the warning pipe.**

[That the words "connected to" should be substituted for "branched into" in line 6 of regulation No. 24, and that all the words after "water" in line 9 should be omitted, and the following words added, viz., "to overflow by the warning pipe, provided that this regulation shall not require any existing ball-valve or inlet-pipe to be altered or refixed or replaced in cases where the ball-valve is or can be made to be in such working order as to prevent the overflow of water as aforesaid."]

†25. *Weight and dimensions of ball-valves.*—Every ball-valve shall be so constructed and fixed as to shut off when under a pressure of 100 lbs. per square inch, and shall be provided with a copper ball, fitted with a brass stud to screw on to the lever. The piston of the valve which comes in contact with the seating shall be screwed, and fitted with a cap to contain the rubber washer, which shall be made of 3-ply rubber of the best quality. The ball-valve and various parts shall be of not less than the following weights and dimensions. [Then follows a table which we have not space to print.—ED.]

["That the words 'which may hereafter be provided' should be inserted after 'ball-valve' in line 2 of the regulation."]

26. *Waste pipes to be removed or converted into warning pipes.*—No overflow or waste pipe other than a "warning pipe" shall be attached to any cistern supplied with water by the company, and every such overflow or waste pipe existing at the time when these regulations come into operation shall be removed, or [at the option of the consumer shall be] converted into an efficient "warning pipe," within two calendar months next after the company shall have given to the occupier of, or left at, the premises in which such cistern is situate, a notice in writing requiring such alteration to be made.*

["That the regulation be struck out and the old regulation substituted."]

27. *Arrangement of Warning Pipes.—The outlet of* every "warning pipe" shall be placed in such a situation *outside the house* as will admit of the discharge of the water [from] *for* such 'warning pipe' being readily [ascertained] *seen* by the officers of the company *entering the house.* And the position

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
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of such "warning pipe" shall not be changed without the previous [notice to and approval by] *consent of* the company. *Every "warning pipe" shall be made to discharge not less than 2 ft. above any drain, sink, or gully, over which the same may be fixed.**

[That regulation No. 27 should be struck out, and the old regulation substituted.]

‡28. *Weight of Lead Pipes having Open Ends.*—Every lead "warning-pipe" and other lead pipes of which the end is open, so that such pipe cannot remain charged with water, may be of the following minimum weight, that is to say—

	½ in. (internal diameter)	3 lbs. per yard.		
	¾ "	do.	5 "	"
	1 "	do.	7 "	"
New	1¼ "	*do.*	9 "	" *New**
New	1½ "	*do.*	12 "	" *New**
New	1¾ "	*do.*	16 "	" *New**
New	2 "	*do.*	18 "	" *New**

[No recommendations were made by the Committee or Conference to this and the next proposal.]

29. *Ordinary Draw-taps.*—No draw-tap shall in future be fixed unless the same shall be sound and suitable, and of the "screw-down" kind.

[Regulations 30, 31, 32, and 33, as proposed by the companies, are as follows, the recommendations of the Committee, in brackets, being agreed to by the Conference.]

† 30. *Direct Draw-taps.*—A draw-tap of a proper screw-down pattern may be placed in connexion with the "communication pipe" in a suitable position in any house or building.

[That regulation No. 30 should be amended so as to read as follows:—"Draw-taps of proper screw-down patterns may be placed in connexion with the rising main, or branches from the rising main, in suitable positions in any house or building."]

31. *Draw-taps in connexion with stand-pipes.*—Every draw-tap in connexion with any "stand pipe," or other apparatus outside any dwelling house, in a court or other public place, to supply any group or number of such dwelling houses, shall be sound and suitable and of the "waste preventer" kind, and be *properly* protected [as far as possible from injury by], *to the satisfaction of the company, against* frost, theft, or mischief.*

[That the words "to the satisfaction of the company" be omitted from the regulation.]

32. *Boilers, Water-closets, and Urinals to have Separate Feed Cisterns.*—There shall be no direct communication [from] *between* the pipes of the company [to] *and* any boiler [urinal or water-closet], *water-closet, urinal, drain, trap, gully, flushing cistern, or service box.* Every boiler [urinal and water-closet in which water supplied by the company is used (other than water-closets in which hand flushing is employed) shall, within three months after these regulations come into operation, be served only through a cistern or service box and without a stool cock] *shall be supplied through a separate covered feed cistern, and every water-closet and urinal through a covered flushing-cistern or covered service box, all such supplies being taken from a storage cistern. Stool cocks, or other apparatus by which water may be allowed to flow continuously into any water-closet pan or urinal are prohibited.* [No pipe by which water is supplied by the company to any water-closet shall communicate with any part of such water-closet, or with any apparatus connected therewith, except the service cistern thereof.]*

[Joint Committee and Conference.—That the regulation be struck out and the old regulations (Nos. 20 and 24) substituted.]

† 33.—*Definition of water-closet.* — The word "water-closet" in these regulations shall include any slop-hopper.

[Joint Committee and Conference.—(*a*) That the words "sink used for receiving any solid or liquid excremental filth" should be substituted for "slop-hopper" in Regulation No. 33.

(*b*) That words should be added to Regulation No. 33 to provide that the regulation shall not be deemed to entitle a water company to make a charge for supplying water to a "slop-hopper" or "sink used for receiving any solid or liquid excremental filth," as if such "slop-hopper" or "sink" were a "water-closet."]

Regulation 34, as proposed, is as follows :—

34. *Water-closet Apparatus.*—Every water-closet *flushing* cistern, or [water-closet] service-box hereafter fitted or fixed in which water supplied by the company is to be used, shall have an efficient waste-preventing apparatus so constructed *and maintained* as [not to be capable of discharging] *to prevent the discharge of* more than two gallons of water at each flush *or a continuous flow of water, and shall not be automatic.**

The Joint Committee recommended as follows :—

(*a*) That the Council do express at the inquiry its view that water-closet flushing cisterns should be capable of discharging three instead of two gallons, but that having regard to the recent decision on this question no evidence be called in support of the Council's view.

(*b*) That Regulation No. 34 should be struck out and the old regulation substituted.

Recommendation (*b*) was agreed to, but the following was substituted for (*a*) :—

(*a*) That in the opinion of this conference owners and occupiers of property should be allowed to use *three*-gallon flushing cisterns if they so desire.

The following is proposed by the companies :—

† 35. *Closet and Urinal Service Boxes.*—Services (*sic*) boxes for closets and urinals, if made of cast-iron, shall be of approved design, and if of wrought-iron be galvanised, and constructed of sheets of a thickness of not less than 18 B.W.G., securely riveted, the pitch of the rivets not exceeding 1½ in.; and they shall be provided with a close-fitting cover properly secured. Connecting links, between the levers and the valves, shall be made with suitable slotted, or knuckle joints, shall be made of brass and not be less than ⅜ in. diameter, and a brass plate with a square hole (for wrought-iron service box), or some equally efficient approved arrangement (for cast-iron service box), to prevent the ball-valve from getting displaced from its proper position, shall be provided. Balance weights shall be properly secured with $\frac{3}{16}$-in. diameter wire; cotters or split pins, when used, shall be of brass, and not less than ¼ in. diameter, and washers on service box valves shall be of the best rubber, and not less than ¼ in. in thickness. Where a syphon is used in a service box, the underneath part of the syphon shall be brought above the top of the service box, and there shall be no opening or valve on the down leg of any syphon. The nuts for securing the syphon in position shall not have less than four full threads, and the "top water line" shall be cast upon the inside of each syphon service box on the back and the front, such water line being ¾ inch below overflow pipe. Outlets from closet service boxes shall not be less than 1¼ in. internal diameter, and of the weights and dimensions given below. [Here follows a table.—ED.]

The Joint Committee recommended as follows :—

[(*a*) That the words "which may hereafter be provided" should be inserted after "boxes" in line 2 of Regulation No. 35, and in such other lines as may be necessary for the purpose of making the regulation not retrospective.

(*b*) That the word "suitable" should be substituted for "approved" in line 3 of Regulation No. 35.

(*c*) That the words "three-eighths of an inch measured across the outside diameter of the link" should be inserted after "than" in line 11 of Regulation No. 35, in lieu of the words "⅜ inch diameter."

(*d*) That the word "approved" should be omitted from line 14 of Regulation No. 35, and the words "or painted" inserted after "cast" in line 28.

(*e*) That words should be added to Regulation No. 35 to provide that the supply pipe to the flushing cistern shall be of not less than a prescribed diameter so as to ensure the rapid filling of the flushing cistern.]

The following was agreed to by the Conference: [That Regulation 35 be opposed with a view to its being struck out of the regulations; but in the event of the opposition being unsuccessful, the amendments proposed in recommendations (*a*),(*b*),(*c*) and (*d*) be pressed, and that in any case the proposal in recommendation (*e*) be pressed, and that in (*e*),after the words "supply pipe," the words "and union" be inserted.]

No recommendation was made by either Committee or Conference on the following :—

36. *Water-closet down pipes.*—Every "down pipe" hereafter fixed for the discharge of water into the pan or basin of any water-closet shall, *when the bottom of the service box is more than 4 ft. above the top of the closet pan,* have an internal diameter of not less than 1¼ in., and *the outlet of the service box and the down pipe shall have an internal diameter of 1½ in. when the bottom of the service box is less than 4 ft. above the top of the closet pan. The down pipe,* if of lead [shall weigh not less than 9 lbs. to every lineal yard], *may be of the weight prescribed in No. 28 of these regulations.**

The companies propose the following as Regulation 37 :—

37. *Urinal Service Box Apparatus.*—Every urinal [cistern] *service box* in which water supplied by the company is used, other than public urinal [cisterns, or cisterns having attached to them a self-closing apparatus] *service boxes,* shall have an efficient "waste-preventing" apparatus so constructed *and maintained* as [not to be capable of discharging] *to prevent the discharge of* more than one gallon of water at each flush *or a continuous flow of water, and shall not be automatic.*

*Outlets from urinal service boxes shall be made in accordance with weights and dimensions given for nuts and linings in No. 18 of these regulations.**

The Joint Committee recommended and the Conference agreed to the following :—

(*a*) "That the words 'which may hereafter be provided' should be inserted after 'service box,' and the words 'for each urinal or urinal compartment' inserted after 'flush.'

(*b*) "That the words '(except when the water is supplied by measure)' should be added after 'flow of water,' and the words 'and shall not be automatic' omitted."

The companies propose :—

† 38. *Automatic Flushing Boxes Prohibited.*—No apparatus capable of discharging automatically shall be fitted or fixed except by special agreement with the company in writing under the hand of their secretary.*

The Joint Committee recommended :—

"That the words 'when water is supplied by measure' should be inserted in place of all words after 'except.'"

The following, however, was the resolution of the Conference :—

"That the words 'when water is supplied by measure or' should be inserted after 'except.'

That the words 'under the hand of their secretary' should be omitted.

That words should be added to the regulation to provide that in the event of the company refusing to allow automatic flushing apparatus there shall be an appeal to the local sanitary authority, whose decision shall be final."

The companies propose the following as Regulation 39 :—

39. *Bath Apparatus.*—In every bath hereafter fitted or fixed, the outlet shall be distinct from, and unconnected with, the inlet or inlets. The inlet or inlets must be placed so that the orifice or orifices shall be *at least 2 inches* above the [highest water level] *warning pipe or top* of the bath, *and* the outlet of every such bath shall be provided with a perfectly water-tight plug, valve, or cock.*

[The Joint Committee recommended and the Conference agreed that the regulation be struck out and the old regulation substituted.]

The companies propose the following as Regulation 40 :—

40. *Bath to be without Overflow Pipe.*—No bath *or fixed basin* supplied with water by the company shall have any overflow [waste-pipe], except it be so arranged as to act as a "warning-pipe."*

[The Committee and the Conference agreed that the regulation should be struck out.]

Regulation 41, as proposed, is as follows :—

41. *Alteration of Fittings.*—No alteration shall be made in any fittings in connexion with the supply of water by the company, without [two] *three* days' previous notice in writing to the company.*

[The Committee recommended that the following words should be inserted after the word "company" in line 3 of Regulation No. 41, viz.—"Except such repair or replacement or alteration as may be necessary to prevent leakage, waste, or damage by water."*

The Conference agreed to this with the following addition;—"That 'two' be retained instead of 'three' in line 3 of the regulation."]

The next proposed regulation is :—

42. *Existing Fittings.*—All existing fittings, which shall be sound and efficient, and are not *specifically* required to be removed or altered under these regulations, shall be deemed to be prescribed fittings under the Metropolis Water Act, 1871; *but when any such fittings become defective and cannot be efficiently repaired, they shall be replaced with fittings as prescribed by these regulations.**

[The Committee recommended and the Conference agreed that the words "and are not specifically required to be removed or altered under these regulations," and all the words after "1871" should be omitted, and that the definition of "fittings" given in Section 3 of the Metropolis Water Act, 1871, should be added.]

On the following proposed regulations neither the Committee nor the Conference had any recommendations to make :—

43. *Penalties.*—Every person who shall wilfully violate, refuse, or neglect to comply with, or shall wilfully do or cause to be done any act, matter, or thing in contravention of these regulations, or any part thereof, shall, for every such offence, be liable to a penalty in a sum not exceeding 5*l.*

44. *Authorised Officer may Act for Company.*—Where under the foregoing regulations any act is required or authorised to be done by the company, *or approval or consent given,* the same may be done *or given* on behalf of the company by an authorised officer or servant of the company, and where under such regulations any notice is required to be given by the company, the same shall be sufficiently authenticated if it be signed by an authorised officer or servant of the company.*

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
† The whole of this regulation is new.
‡ In the old regulation the word "all" was used instead of "every," and the consequential alterations made.

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
† The whole of this regulation is new.

* Words omitted from the old regulations are shown between brackets and the words added are in italics.
† The whole of this regulation is new.

But the Conference passed the following general resolutions:—

"That a regulation be added that in case of frost the companies shall be required to erect stand-pipes in convenient places for all consumers.

That this Conference asks the London County Council to take all steps that may be necessary to obtain the amendments to the proposed regulations now determined by the Conference.

That this Conference supports the recommendation of the London County Council, that if these alterations are made the cost of making them should be borne by the companies."

The Conference then concluded.

Illustrations.

ST. PETER'S AND BERNINI'S COLONNADES.

THIS view of the great basilica and the converging colonnades of the approach, though familiar enough to most of our readers, may be of interest taken in connexion with Professor Aitchison's Royal Academy lecture reported in another column. We see here the work of three of the architects who were connected with St. Peter's. The dome is Michelangelo's, or at least from his design, though only carried up to the cornice of the drum in his lifetime; the façade is Carlo Maderno's; the flanking colonnades are Bernini's.

The view gives the opportunity of showing how much the exterior effect of the dome, as the dominant feature of the whole, suffers, even when seen from the further side of the square, by the lengthening out of the nave, though it may be admitted perhaps that the interior effect is added to by the vista. As the dome is perhaps the most beautiful of the large domes of the world, so the façade is one of the worst of any great cathedral in the world, being entirely destitute of coherence or power of design, and impressive solely from its immense scale.

COURTYARD AND CASTLE TOWER, MILAN.

THESE illustrations represent the courtyard of the Archbishop's Palace at Milan, and two views of one of the towers of the Castle; the latter a modern restoration carried out under Signor Moretti, the architect to the municipality. They are both referred to and described in the first article in the present issue.

DESIGN FOR AN ENTRANCE GATEWAY TO A PUBLIC PARK.

THIS design, by Mr. Ralph Knott, was submitted in competition for the Tite prize given by the Institute of Architects, and received the second prize of ten guineas. Without any disparagement to the design which received the first prize, which is also a good one and which we shall have the pleasure of publishing, we considered from the first (after a long and careful examination of the drawings) that this was the best design, and we therefore give it the first place in publication.

The object of the Tite prize should not be merely correctness in the application of Italian details, but the study of this type of architecture with a view to its further development, and this object seems to be attained in Mr. Knott's design, which, though entirely founded on Italian architecture, has nevertheless a certain degree of novelty, and agreeable novelty, especially in the treatment of the accessory ironwork. The centre block of the gateway, with its sculptural decorations, is also exceedingly harmonious and well balanced.

Mr. Knott writes, in explanation of his intention in the design—"The centre gateway is for Royal or otherwise important processions, the others, on either side, are to be 'In' and 'Out' respectively, the pedestrians' entrances being kept well away to avoid mud, splashes, &c. The curved plan has, I think, the advantage of allowing people full warning of approaching carriages. I have purposely omitted any lavatory accommodation or attendants' quarters, as I consider it would have be-littled the elevation; but there is ample room in the semicircular space in either pedestrians' entrance for a chair for the gate attendant in wet weather."

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association on the 30th ult., Dr. W. de Gray Birch, F.S.A., in the chair, Mr. R. W. Forster gave a lecture upon the Roman Wall, illustrated by over fifty lantern slides, many of which were prepared specially for the purpose. After a short description of the situation and design of Hadrian's Wall, and a brief statement of the questions concerning the wall and the earthen vallum, the views were shown illustrating the chief portions which still remain. The series began with the most easterly fragment of the wall, near Heddon; and this was followed by three views near Downhill, in the neighbourhood of Corbridge, where the vallum makes a sudden bend and skirts the south side of the hill, while the wall keeps to the northern brow. At this point an ancient road has recently been discovered, cutting through the vallum; and it has been suggested that the road is Roman, and the vallum therefore of earlier date than the wall. Downhill, however, has been extensively worked for limestone at an early date, and it is hardly possible to assign a definite date to many old roads and tracks which lead to it. Even if the road in question be Roman, the lecturer considered that fact did not prove what is alleged; for the Roman occupation lasted for nearly three centuries, and probably the vallum was not kept in repair after the province south of the barrier had settled down. Several views were shown of the remains at Cilurnum (the Chesters), including the flagstone pavement recently exposed in the Forum, from which inscriptions may be possibly recovered, if the lower sides of the stones are examined: also the larger eastern gateway, with the wall coming up to its southern side, so that this gate, as well as the north and main west gates, opened on the northern side of the defences, possibly to enable cavalry to issue with greater speed from the fortress. Cilurnum was garrisoned by the second *ala* of Asturians. Views were shown of the large suburban building between Cilurnum and the North Tyne, which has been described as a bath or a temple, but was probably a villa. The largest chamber has a row of seven niches, which perhaps originally held statues representing the seven planets and the seven days of the week; in size and in appearance they resemble the niches of the reliefs discovered at Plumpton in 1813, which represent five of those deities (see "Lapidarium Septentrionale," p. 411, No. 805). Another view showed the alcove opening out of the long chamber, with the lower part of its window, below which many fragments of glass were found. At the back of the villa is a space bounded by three walls and open behind; it seems to have been roofed over, and in one corner is a hatch or small window, opening on the floor level of one of the rooms within, and below this hatch the hypocaust is brought outside the building, forming a kind of table. It was suggested that this space was the kitchen of the villa and that the hypocaust formed a kind of "hot plate" on which the dishes were placed before being passed through the hatch to the triclinium. A series of views of Borcovicum were next shown, beginning with the gate in the valley on the east of the fort, formerly supposed to be a means of access to the so-called amphitheatre on the north of the wall. This, however, has recently been proved to be merely an old quarry, and the purpose of the gate was evidently strategic. Views of the east, west, and north gates of the fortress were exhibited, as well as of the recently excavated praetorium and the fine water tank in the south-east corner. Views of the Housesteads Mile Castle, showing how the massive north gate was partially walled up during the latter part of the Roman occupation, and several views of the remains of the wall on the basalt hills besides the North-umbrian lakes, were shown. Attention was directed to the manner in which, at the gaps in the line of hills, the wall is drawn back so as to command both flanks of an attacking party, and also to the sudden changes of thickness which occur at many points. Dr. Bruce's theory, that these show the places where the working parties joined up their sections, seems insufficient. As a rule the insets go in pairs forming a shallow recess in the south side of the wall, generally less than a foot deep, and from 20 to 200 ft. long; and in many cases the lowest course is not set back at all. Just east of the Housesteads Mile Castle the breadth of the wall changes seven times in 130 ft. The series of views ended with that of the last fortress, of which the name can be identified. In view of the forthcoming Congress at Newcastle-on-Tyne the lecture was much appreciated.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on Monday evening, February 4, at the Royal United Service Institution, Whitehall. Mr. Henry O'Connor, the President for 1900, occupied the chair, and presented the premiums awarded for papers read during that year, viz.:—The President's Gold Medal to Mr. Henry C. H. Shenton for his paper on "Recent Practice in Sewage Disposal"; the Bessemer Premium to Mr. Richard F. Grantham for his paper on "The Closing of Breaches in Sea and River Embankments"; a Society's Premium to Mr. C. Rous-Marten for his paper on "English and French Compound Locomotives"; and a Society's Premium to Mr. Robert Henderson for his paper on "Paper-Making Machinery." Mr. O'Connor then introduced the President for the present year, Mr. Charles Mason, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year. Upon the motion of the President a resolution of sympathy and condolence with the King and Queen and the other members of the Royal Family upon the death of her Majesty Queen Victoria, and expressive of loyalty to the Throne, was unanimously passed. The President then proceeded to deliver his inaugural address, in the course of which, although not making a review of the engineering profession during the past 100 years the main subject of his address, he dwelt briefly upon the marvellous progress made, instancing works of the present day as compared with those designed for the same objects at the commencement of the century. The President then proceeded to review the progress of the Society, which was founded in 1854 with about 100 members, and which now numbered 500 members and associates. The financial position of the Society was also favourable, there being a substantial excess of income over expenditure, and an extremely satisfactory accumulated fund. The practice of a municipal engineer was then referred to, with special reference to work in large towns, and surprise was expressed that more headway had not been made with regard to the general adoption of a scheme of subways for drain-pipes, &c., in London, the few now existing being frequently too small for the purposes they were intended to serve. An ideal subway was described by which the entire width of the street should be occupied. The science of heating and ventilation was discussed with special reference to domestic heating, and to the small extent to which well known and efficient systems of heating had been adopted in private houses, old associations and cheap fuel being the prime causes for want of progress in the matter. The advantages and disadvantages of warming by steam hot water, and hot air were stated, the President pointing out that it was impossible to adopt the same principle for all buildings. Steam, he said, as a heating medium, was not adapted for warming private houses, churches, or institutions where skilled labour was not permanently employed. In such buildings low-pressure hot water formed a far better system, being more easily managed and not requiring such constant attention. The President concluded by briefly referring to ventilation as being closely allied to and dependent upon heating; the introduction of an ample supply of pure fresh air being the main consideration in arranging any system (whether natural or mechanical), without allowing such air to become overheated or to cause draughts on its admission into the apartment. Want of attention in the working of an apparatus after it had been installed was the chief cause of inefficient working. It was often the case that in a ventilating plant the air flues and inlets were seldom properly cleaned, and a thoroughly efficient heating apparatus might often be condemned through inattention to small details in management, such as regulating valves and cleaning flues, the engineer receiving the blame which should be bestowed on the caretaker.

THE INSTITUTION OF JUNIOR ENGINEERS.—The first of the series of six lectures on "Works Management" was delivered at the Westminster Palace Hotel on Tuesday evening, February 5, by Mr. A. H. Barker. The appreciation of the arrangements made by the Institution for the delivery of these lectures was manifest from the very large number present. The Chairman, Mr. Percival Marshall, in opening the proceedings, referred to the opportunities which those attending would have in the discussion at the close of each lecture for obtaining special information bearing on their own particular work. The lecturer's introductory remarks dealt with the general state of organisation in this country, with special application to engineering firms. The causes of our present position in the market, questions of experience, and selling power of products were then treated. The best methods for dissection of orders and of providing continuous work for operatives engaged attention. An analysis of the number of employees in different shops and of machines used followed, with prices of equipment. Some valuable curves were exhibited showing the relative cost in each case of machine tools, fitters' tools, &c. The questions of buildings, driving power, electrical *versus* mechanical driving were considered; and the lecture concluded with some figures relating to the determination of various particulars in connexion with the size of steam-engines and boilers. Mr. Barker supplemented the lecture by further information in reply to questions put to him at the close. The next lecture takes place on Wednesday, February 20.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Alderman Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Hackney Borough Council 9,750*l.* for street improvement and paving works; the St. Pancras Borough Council 830*l.* for electric lighting of public buildings; the Shoreditch Borough Council 4,460*l.* for paving works; the Hampstead Borough Council 17,220*l.* for electric light installation; the Hammersmith Borough Council 2,220*l.* for underground convenience, and the School Board for London 200,000*l.* for schools, &c.

The Horniman Museum.—The Chairman read a letter which he had received from Mr. E. J. Horniman, who said he was empowered by his father, Mr. Frederick John Horniman, M.P., who is now travelling in the East, to offer as a free gift to the people of London some 15 acres of freehold land, together with the museum which had just been erected at the cost of about 40,000*l.* In it were placed the large art and natural history collections gathered by Mr. Horniman during the last twenty-five years. The property is situated close to Lordship-lane Station on the South-Eastern and Chatham Railway, and about three-quarters of a mile from Forest Hill Station on the London, Brighton, and South Coast Railway. It consists of a large house known as Surrey Mount and some 9½ acres of pleasure grounds on the summit and slope of a hill commanding extensive views over South-Eastern and South-Western London.

On the motion of Mr. Torrence, the Vice-Chairman, seconded by Mr. Fletcher, Deputy-Chairman, it was agreed that the offer be accepted, and that the thanks of the Council be communicated to Mr. Horniman.

Tramways.—The Highways Committee recommended, and it was agreed, that the Council do approve the estimate of 7,900*l.*, submitted by the Finance Committee, in respect of the cost of construction of the new tramways in Crowndale-road, Agincourt-road, and Constantine-road, authorised by the London County Tramways Act, 1900; and that the Highways Committee be authorised to arrange for the carrying out of the work by the Council's tramway department and under the supervision of the tramways manager.

The Proposed New Water Regulations.—The Water and Public Health Committee brought up a joint report on the proposed amended regulations of the metropolitan water companies. The recommendations of the report were submitted on Monday to a conference of local representatives, and were endorsed with a few emendations, as will be seen from our report of the conference on another page.

Mr. M'Kinnon Wood, Chairman of the Joint Committee, moved the reception of the report, and stated that the conference was unanimous in condemning these regulations, and especially that which required that every house, flat, and tenement should have a cistern. The Local Government Board were opening an inquiry into the regulations on Monday next, and it was highly important that the County Council should express its opinion upon them.

Mr. Beachcroft thought some of the proposed regulations might be useful.

Mr. Webb regarded them as an infamous attempt to put the householders of London to a great expense.

Mr. H. Clarke was in favour of opposing that attempt to the utmost.

Mr. Westacott regarded it as scandalous.

Mr. Benn said that the new regulations were part and parcel of the system of persecution which the London consumers had suffered at the hands of the water companies for many years.

Mr. Shaw-Lefevre doubted whether it was lawful to compel persons to again provide themselves with cisterns. The action of the water companies was a move in anticipation of purchase, for the direct purpose of increasing the value of their property.

Mr. Burns, M.P., rejoiced that the plucky crusade of the London County Council against the water companies for the past twelve years had been endorsed by a representative body of delegates from the City and the Local Authorities of London.

Mr. Harris said that some of the regulations were possibly of a useful character, but many of them were, to say the least of it, a rather large order. Moreover, in view of the present position of the London water question, this was a very inopportune moment to bring them forward. On those grounds, he was generally opposed to the regulations, and supported the request that the inquiry should be adjourned.

The Council proceeded to discuss the recommendations of the Joint Committee, *seriatim*. The most important related to the proposed regulation requiring the provision of cisterns, which the Joint Committee recommended should be opposed at the inquiry, with a view to its being struck out.

Mr. Beachcroft suggested that the Council should not oppose the regulation, except to prevent its being made retrospective. If an effort was to be made to introduce sanitary cisterns, the Council ought not to be the body to resist it.

Mr. Emden regarded the system of cisterns, especially in the smaller houses, as an absolute death-trap. No form of cistern had been invented which could be always kept from fouling.

Mr. M'Kinnon Wood hoped the Council would speak with no uncertain voice upon this matter, and would support the unanimous conclusion of the Conference of Borough Councils.

Mr. Jeffrey said the object of the companies in reviving that iniquitous system was to get out of their obligations with regard to high pressure.

Dr. Longstaff thought there was more public danger arising from a temporary deprivation of water by a breakdown of the supply than from the use of cisterns.

The Council divided, with the following result:—For the recommendation, 99; against, 4.

The remaining recommendations were agreed to, with the alterations made at the conference the previous day.

Theatres, &c.—The following recommendations in regard to theatres, &c., were agreed to:—

Private Pass Doorway, Great Queen-street Theatre (Mr. J. Murray).

Reconstruction of the Imperial Theatre, Westminster (Mr. F. T. Verity).

Temporary building at the London Exhibitions (Mr. A. O. Collard).

Heating Arrangements, Wandsworth Public Baths (Messrs. Spalding & Spalding).

Housing: Churchway scheme, St. Pancras.—The housing of the Working Classes Committee reported that under the Churchway, St. Pancras, scheme, now being carried out by the Council under Part I. of the Housing of the Working Classes Act, 1890, the Council is required to provide accommodation on the cleared area for 580 persons, out of a total number of 1,095 persons thus displaced. Provision will, however, be made for 832 persons in dwellings to be erected on both sides of Churchway. Two houses in the block of dwellings which is being erected on the west side of Churchway will shortly be completed, and ready for occupation. The dwellings will be known as Wellesley Buildings, and will provide accommodation for 360 persons in 60 two-room tenements and 20 three-room tenements.

Subways.—Mr. Parker moved: "That it be referred to the General Purposes Committee to consider the best manner of bringing before the Borough Councils the imperative necessity of making subways under, at least, all the leading thoroughfares of the metropolis to contain all the gas and water pipes and telephone and telegraph wires; and, if necessary, to summon a conference to formulate some comprehensive scheme for remedying the scandalous and ever-increasing inconvenience to pedestrian, omnibus, and mercantile traffic caused by the constant tearing up of the footways and roadways for the purpose of inserting or removing the pipes, wires, &c., above referred to.

Mr. Baker seconded the motion, and it was agreed to.

The Council soon after adjourned.

PANAMA CANAL WORKS.

AT an ordinary meeting of the Institution of Civil Engineers on the 5th inst., the President, Mr. James Mansergh, before beginning the ordinary business, proceeded to make known the terms of an address which it was proposed should be transmitted to his Majesty the King on behalf of the whole body of members of the Institution, expressing their profound sympathy on the death of the late revered Queen, and their loyal congratulations on his Majesty's accession to the throne. The address was adopted, *nemine contradicente*, the whole audience standing.

The paper read was on "The Present Condition and Prospects of the Panama Canal Works," by Mr. J. T. Ford, M.Inst.C.E. The paper began with a few remarks as to the general importance of the subject, and expressed the hope that the facts put forward might tend to modify the somewhat unjust estimate that had been formed of the character of the distinguished originator of the Panama Canal works, owing to the unfortunate cessation of work at the Isthmus. A short historical sketch of the work was then given, from its inception at the International Congress in Paris in 1879 down to the liquidation of the old company and the formation of the New Panama Canal Company under the auspices of the officers appointed by the French courts. The labours of the new company were discussed and classified under three important heads. First, the maintenance and recovery of all the plant, material, and buildings on the Isthmus that could be considered valuable on a resumption of the work at a future date. Second, the formation of a Technical Commission of Engineers, to make surveys in detail, borings, and meteorological observations; to determine the feasibility or otherwise of the Canal under any plan of construction; and to submit to the company such plans as they would recommend for completion of the work, with full estimates, &c. Third, the prosecution of such excavation work on the Canal itself, principally on the great cuts of Culebra and Emperador, as would be not only substantial progress on the work itself under any plans that might finally be adopted, but might also serve to prove the perfect possibility of those great cuts which had been questioned, with the result that doubt had arisen as to the feasibility of the whole work. Further, to carry out the deepening of the channel in the Bay of Panama, and the construction of a large steel pier at that end of the Canal, so that vessels in the Pacific could come alongside, and in connexion with the Panama railway (principally owned by the Canal Company) an improved and more economical method of handling the traffic across the Isthmus could be established, to the benefit of the Canal enterprise itself during the continuance of the work of construction.

The subject of the present position of the Canal works and their future prospects was then dealt with under the following five headings, the conclusions therefrom being in the author's opinion generally favourable to the continuance of the work:—(1) The present

condition of the works, after their practical abandonment and neglect for upwards of eight years, in its bearing on the question of the stability or permanency of such work in that particular region, in the event of the Canal being completed ; also, the present condition of encampments, and provision for the large number of labourers to be employed on different sections. (2) The fitness for service in the continuation of the work of the existing plant, machinery, and materials generally, judging from their condition to-day as to state of preservation, more or less obsoleteness of pattern, &c., and the extent to which new material would be required. (3) The extent to which the investigations and published reports of the New Panama Canal Company inspired confidence in the solution of the physical and technical problems admittedly left doubtful by the old company, and the nature of the essential points that caused adverse criticism and differences of opinion among eminent engineering authorities as to the possibility or otherwise of constructing the Panama Canal at all. (4) A general description of the essential features of the plans finally adopted by the International Commission of Engineers, invited by the new company to decide upon various projects after making their own independent and detailed investigations, with dimensions of the several sections of the work, &c. (5) The author's estimate of the proportion of the total work already completed, the time required for completion, and the reasons for such conclusions.

It was stated that the works were in far better condition than was generally supposed, even the maritime or sea-level sections—those most exposed to tidal and flood damages—having suffered but little. Further, that while a considerable amount of new plant would be required, there remained much that was still serviceable, as had been shown by the work accomplished by the New Canal Company. With regard to the inherent difficulties to be encountered in the construction of any canal at Panama, whether at sea-level or with locks, the author expressed the opinion that a sea-level canal, although it would be extremely costly, would be in every sense feasible, and would certainly be the ideal solution of the problem. The three main difficulties of a canal at Panama were :—The question of water-supply for lockage purposes during the dry seasons ; the control of the Chagres River during its flood seasons ; and the nature of the material encountered at the great cuts of Culebra and Emperador.

These three important questions having been thoroughly and exhaustively examined with actual experimental work under practical conditions, a favourable solution to all of them had been given by three alternative plans submitted to the company, all equally feasible, for a lock-canal with the summit-level at 126 ft., 98 ft., and 62 ft. respectively above sea-level ; one of these, the medium plan, with summit elevation at 98 ft., was recommended. The author strongly urged the superior advantages of the lower plan with summit-level at 62 ft. above sea-level in opposition to the plan recommended by the Commission. A full description was given of the route and engineering features of the plan adopted, the general lines of which were identical for all three projects, except in the important feature to which the author objected, viz., the auxiliary supply canal from the storage reservoir above the Alhajuela dam to the summit-level of the Canal. This feature would be eliminated with great advantage by the adoption of the 62-ft. level.

The author was of opinion that, assuming the Canal to be completed according to the plan proposed by the Commission (and taking into account the general work done, not only in excavation proper, but in the establishment of existing conditions on the Isthmus, opening up and improving sanitary conditions, settlement of a permanent population as a nucleus for the labour supply, &c., &c.), the effective work already accomplished on the Canal fairly represented a sum of money equal to the amount still to be expended, according to the estimate of the Technical Commission, for completion, and that the Canal could be completed in eight or ten years ; hence one-half of the Panama Canal might be considered as already completed, in spite of the admitted extravagance and errors of the old company. The author's reasons for this conclusion were given at some length.

The paper concluded with some general remarks as to the existing sanitary conditions of the Isthmus of Panama, showing great improvement in recent years, as a result of the Canal works ; and without entering into any comparisons with other proposed routes for a canal across the Central American Isthmus, the author was of opinion that at no place other than Panama could a canal of equal capacity and general advantages as to stability, low cost of maintenance, facility of transit, and safety and sufficiency of harbour accommodation at both ends be completed for the same cost or within the same period of time. In an appendix to the paper a summary of quantities and items of expense included in the 20,816,000*l.* needed to complete the work was given, extracted from the published reports of the Technical Commission.

NATIONAL SOCIETY FOR CHECKING THE ABUSES OF PUBLIC ADVERTISING.

THE above-named society, known among its adherents briefly as "S. C. A. P. A.," has issued to its members (who now number about a thousand) the following circular, which may be very well worthy of attention beyond the limits of the Society :—

"1, Camp View, Wimbledon Common.

The approach of an election for the County Council offers to our London members an opportunity of doing substantial service.

As a result of efforts made by those interested in diminishing the grosser forms of advertising disfigurement, the Council have—

1. Absolutely prohibited sky signs.
2. Refused to allow advertising in the tramcars on lines under their control.
3. Passed by-laws enabling the Council to forbid flashlights and illuminated advertisements where they are dangerous to traffic.

You will see that the Council (except in the management of their own property) confines its assumption of power to cases where it is possible to suggest that there is danger to 'life or limb.' We believe that there has been a very strong feeling in the Council in favour of checking, on purely 'æsthetic' grounds, the present tendency to destroy the architectural propriety and dignity of London But to enable them to make suitable regulations, special legislation would probably be necessary, and owing to the claims of other far more contentious topics, our views, though theoretically commended, have been in practice neglected. This will not be the case in the Council which has to be elected in March next, if in the meanwhile our members and friends do their duty as electors or as residents. We believe that when the Council has distinct evidence of the strength of the feeling existing on the subject, they will be glad to take action for obtaining statutory powers.

Edinburgh set the example in 1899, when, in spite of the interested opposition of some trade associations, Parliament gave it adequate rights of control. Dover, Chesterfield, and (in a less degree) many other municipalities are applying this year for similar authority. London, we are convinced, has only to ask to obtain. But the first stage is to impress upon all candidates that the question is regarded as serious and urgent.

It is suggested by one of our many friends in the Council that at meetings held to promote the interests of candidates the following or some similar question should be handed in writing to the chairman, and that a definite answer should be obtained from the candidate or candidates :—

'Are you in favour of measures to check advertising disfigurement in the metropolis ?'

We do not ask you to make your vote or your support dependent upon the view the candidate may take, but we may safely say that evidence of genuine interest in our aims ought to count as a virtue.

We are only too well aware that many quiet-loving citizens find it distasteful, and that others are too busy to attend to municipal affairs. But we would urge that it is only by using personal influence to secure the best order of representatives that the better standard can be made to prevail. The labours which have for many years been devoted to the development of a sound opinion on the disfigurement question can be rendered effective only by the co-operation of members within their several spheres of individual action.

ALFRED WATERHOUSE, R.A., *President.*
RICHARDSON EVANS, *Hon. Secretary.*"

BAPTIST CHAPEL, HORFIELD, GLOUCESTERSHIRE.—A Baptist chapel, in Brynland-avenue and Gloucester-road, Horfield, was opened on the 16th ult. Messrs. Drake & Pizey were the architects, their plans having been selected in competition. A clock which has been presented to the chapel was designed by Mr. Drake. The case was made by Mr. Ridd, and the works by Messrs. W. W. Kemp & Co., of Stokes Croft.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage.

Hackney, North.—Eight houses, with bay windows, on the east side of Upper Clapton-road, Hackney, between No. 174 and Moresby-road (Mr. G. H. Paine for Mr. C. C. Paine).—Consent.

Brixton.—A children's hospital on the east side of Clapham-road, Kennington, at the corner of Prima-road (Mr. H. P. Adams for the Committee of the Belgrave Hospital for Children).—Consent.

Greenwich.—A dwelling house on the south side of Manor-way, Lee-road, Lee (Mr. L. V. Hunt for Messrs. L. Whitehead & Co., Limited).—Consent.

Peckham.—Four houses with bay windows on the south side of Reynold's-road, Peckham-rye, Camberwell (Mr. A. Wood).—Refused.

Finsbury, East.—An entrance porch to Cocker's Hotel, Charterhouse-square, Finsbury (Mr. E. Haslehurst for Messrs. Wheeler & Warren.)—Refused.

Finsbury, East.—An iron and glass pent roof in front of the City and South London Railway Company's station on the south side of City-road at its junction with Moreland-street (Mr. T. P. Figgis for the City and South London Railway Company.)—Refused.

Hampstead.—A one-story office building on the south-west side of Belsize Park-gardens, Hampstead (Mr. A. F. Faulkner for Mr. W. Willett.)—Refused.

Islington, North.—A one-story coal-office building on the south-east side of Lennox-road, Islington, at the corner of Stroud Green-road (Messrs. Stevens Brothers for Messrs. Meyers, Gilson, & Rose).—Refused.

Islington, North.—One-story shop additions to the flank of No. 122, Dartmouth Park-hill, Islington, to abut upon Langdon-road (Mr. C. Tupman for Mr. F. Bryen).—Refused.

Poplar.—Latrines and a caretaker's cottage at the northern end of Portree-street, Abbott-road, Poplar (Mr. S. L. Walters for Messrs. W. W. Howard Brothers & Co.).—Refused.

Projections.

Greenwich.†—An iron and glass shelter over the entrance to Morton's Theatre, London-street, Greenwich (Mr. A. Roberts for Mr. A. Carlton).—Consent.

Islington, North.†—The retention of bay windows in front of Nos. 2 to 20 (even numbers only) Heathville-road, Islington (Mr. R. Midworth for Messrs. Wootton & Green).—Refused.

Marylebone, East.—That Mr. A. J. Hopkins be informed that the Council is not prepared to accede to his request on behalf of the Columbia Photographic Company for permission to retain three illuminated signs at the second, third, and fourth floor levels respectively in front of No. 122, Oxford-street, St. Marylebone.—Agreed.

Marylebone, East.—An iron and glass shelter at the restaurant entrance on the west side of the Hotel Great Central, Marylebone-road, to overhang the public way in Harewood-avenue (Colonel R. W. Edis for the Frederick Hotels, Limited).—Refused.

Wandsworth.†—The retention of a bay window in front of a house known as Arran, Rutford-road, Streatham (Mr. J. W. Coates).—Refused.

Woolwich.—Bay windows to eleven houses on the north side and seven houses on the south side of Gatling-road, Plumstead (Messrs. Church, Quick, & Whincop for Mr. T. Brandon).—Refused.

Width of Way.

Walworth.—An office building and a boundary fence on the east side of Hemp-row, Darwin-street, Walworth, at less than the prescribed distance from the centre of Hemp-row (Mr. L. H. de Pothonier for Messrs. T. T. Burton & Co.).—Consent.

Limehouse.—Two one-story buildings on the south side of Cinnamon-street, Wapping, at the corner of King Edward-street, at less than the prescribed distance from the centres of those streets (Messrs. Barnes-Williams, Ford, and Griffin for Messrs. A. Jacob & Co.).—Consent.

Bethnal Green, North-east.—Twelve houses on the south side of Prospect-terrace, Usk-street, Bethnal-green, at less than the prescribed distance from the centre of Prospect-terrace (Mr. A. P. Stokes for Mr. C. Lacey).—Refused.

Fulham.—That Mr. W. D. Thompson be informed that the Council is not prepared to accede to his request on behalf of Mr. W. Maynard for permission to retain a one-story stable and cart shelter at the rear of No. 101A, Fulham Palace-road, Fulham, at less than the prescribed distance from the centre of Lurgan-avenue.—Agreed.

Holborn.—Warehouses on the north side of Castle-street, Holborn, at less than the prescribed distance from the centres of Castle-street, Onslow-street,

and Great Saffron Hill (Mr. E. J. May for Messrs. Falk, Stadelmann & Co., Limited).—Refused.

Kennington.—A three-story building at Cumberland Works, Wigton-place, Milverton-street, Kennington, at less than the prescribed distance from the centre of Wigton-place (Mr. A. Parnacott for Messrs. Judge & Co.).—Refused.

Wandsworth.—Buildings and a boundary fence at Gothic Wharf, Brewhouse-lane, Putney, at less than the prescribed distance from the centre of Brewhouse-lane (Mr. S. J. May for Messrs. Carlo Gatti & Stevenson, Limited).—Refused.

Width of Way and Projections.

Holborn.—That the application of Mr. T. J. Anderson for an extension of the period within which the erection of oriel windows at the first, second, and third floor levels of an addition at the rear of No. 28, John-street, Bedford-row, Holborn, to abut upon Little James-street, was required to be commenced, be granted.—Agreed.

Line of Frontage and Construction.

Dulwich.—An iron and glass shelter to adjoin a bakery at the rear of No. 10, Alleyn-terrace, Park-road, Dulwich, at the corner of South Croxted-road (Mr. F. R. Bodley for Mr. L. French).—Refused.

Width of Way and Construction.

Holborn.—A play-shed at the school in Roseberry-avenue, Holborn, at less than the prescribed distance from the centre of Poole's-buildings (Mr. T. J. Bailey for the School Board for London).—Consent.

Woolwich.—An open cart-shed on the north side of Brewery-road, Plumstead, at less than the prescribed distance from the centre of the street (Messrs. Inskipp & Mackenzie for Mr. C. Beasley).—Consent.

St. George, Hanover-square. — Retention of a wooden ticket-office in the yard of Victoria railway station, at less than the prescribed distance from the centre of a roadway (Mr. R. T. Kingham for the London General Omnibus Company, Limited).—Refused.

Formation of Streets.

Brixton.—That an order be issued to Messrs. Shoebridge and Rising sanctioning the formation or laying-out of two new streets for carriage traffic to lead out of Coldharbour-lane and Vaughan-road, Brixton, respectively (Mr. J. Pearman). That the names Vaughan-road (in continuation) and Northlands-street be approved for the new streets.—Agreed.

Fulham.—That an order be issued to Messrs. Cluttons sanctioning the formation or laying out of new streets for carriage traffic on the London Bishoprick Estate, Fulham Palace-road, Fulham, and in connexion therewith the widening and adaptation as a street for carriage traffic of Crabtree-alley (for the Ecclesiastical Commissioners). That the names Woodlawn-road (in continuation), Ellerby-street, Finlay-street, Greswell-street, Harbord-street, Inglethorpe-street, Kenyon-street, Langthorne-street, and Stevenage-road be approved for the new streets.—Agreed.

Height of Building.

Whitechapel.—A warehouse building on the north-east side of Middlesex-street, Whitechapel, at the corner of Cobb-street, to exceed in height the width of Cobb-street (Messrs. D. Cubitt Nichols, Sons & Chuter for Mr. R. Biggs).—Consent.

Working-Class Dwellings.

Bow and Bromley.—A further variation from the plans sanctioned on February 27, 1901, as modified by the plans sanctioned on January 29, 1901, for the erection of a laundry and a block of three intended dwelling-houses, to be inhabited by persons of the working-class, and proposed to be erected, not abutting upon a street, on a plot of land on the east side of Wellington-road, Bow-road, Bow, so far as relates to the erection at the premises of a building, to be used as baths (Mr. C. A. Brereton for the Whitechapel and Bow Railway Company).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

BOOKS RECEIVED.

LAXTON'S PRICE-BOOK FOR ARCHITECTS, BUILDERS, ENGINEERS, AND CONTRACTORS, 1901. (Simpkin, Marshall, & Co.)

SILICO-CALCAREOUS SANDSTONES. By Ernst Stöffler. (E. & F. N. Spon.)

A PRACTICAL TREATISE UPON STEAM HEATING. By Frederick Dye. (E. & F. N. Spon.)

STEPNEY PARISH CHURCH.—We read that the cost of the renovation of the parish church of St. Dunstan amounts to 5,426*l.* 17s. 3d., and that the whole of the money has been subscribed. The repairs, which include re-flooring, re-seating, and the removal of the galleries, were executed under the directions and superintendence of Messrs. J. E. K. & J. P. Cutts.

Correspondence.

To the Editor of THE BUILDER.

"BUILDING CONTRACTS FROM A BUILDER'S POINT OF VIEW."

SIR,—When reading Mr. Frank Cowlin's paper, as read before the Bristol Society of Architects on the 14th ult., and reproduced in your issue of 26th ult., I was much disappointed at the shortness and tone of his remarks in reference to clerks of the works.

I can truly say the clerks of works in Bristol and district *are* the representatives of the architects, and that they furnish all the information required for the due performance of the contracts, as far as my experience goes; and I am pleased to say I have carried out works as the contractor's representative in that part of the country as well as in other provincial towns and in London.

As Mr. Cowlin thinks the clerk of works deserves a paper to himself, I only hope he will give one, and I shall then have an opportunity of criticising it, which will doubtless lead to many improved methods of working by the builders and their agents or foremen.

It seems to me that much friction between the clerk of works and foreman would be prevented if only the builder was more in touch with his foreman. He would find that, instead of a discussion between the clerk of works and the foreman so often taking place, and also ending in personalities, that the materials in question need not have required all this wasted talk had he made a proper agreement with his merchant as to the quality of materials to be delivered, and to be to the architect's satisfaction. Why should the builder not bind his merchant to supply what he himself has already contracted to supply?

Then as to the quality of the work. I find that in nine cases out of ten when having complained to the foreman, and he has objected to my complaint, that his objection was entirely removed when I have suggested that if we (the clerk of works and the foreman) could not agree, then the matter in dispute should be referred to our respective employers—the architect and the builder—to settle. No clerk of works could object to any dispute being thus settled, and the builder and his foreman have an undoubted right to this course; and if it was more often adopted, I feel confident that a deal of unpleasant duty which now devolves on the clerk of works would be better understood by the architect. Also an unqualified clerk of works would be most easily put right.

I have most generally found the cause of slow progress with buildings to be due to the materials being brought late on the works. It often happens that builders altogether under-estimate the time required by manufacturers to get special materials ready. Labour is most often a secondary consideration, and if a builder is anxious *and able* to carry out a contract quickly, it is absolutely necessary that he should get his materials on the site in good time, before they are required, as his foreman cannot very well be expected to tell his master, or the office, that they are keeping the job behind because the materials are being slowly delivered.

Then as to the clerk of works being responsible for the setting out of the building with the foreman, it should be remembered that a competent foreman, with assistance if required, will not allow the clerk of works the chance of finding the setting out incorrect when he checks it, as the clerk of works has his duties to perform, and cannot see the materials being delivered or built into position on one part if setting out on another.

I firmly believe the architect and builder will be brought more in sympathy with each other if they use the necessary tact when dealing with their respective representatives, the clerk of works and the foreman; and that if better prices are needed, builders should tender them, and above all see that, if first-class men are to be obtained as clerk of works and foreman, the salaries as at present paid by many must be much increased.

A CLERK OF WORKS.

THE LOCAL GOVERNMENT ANNUAL.—The issue for 1901 of this useful annual has been sent to us. It is the tenth issue of the work, which is published at No. 2, Dorset-street, Fleet-street, E.C. The directory portion gives the names and addresses of the chief officials of all Corporations, London Borough Councils, County Councils, Boards of Guardians, Urban and Rural District Councils, County and Borough Asylums, &c., throughout the kingdom, as well as the public libraries, public parks, and City companies of London. There is also much useful information relating to the public libraries, baths and washhouses, and electric light undertakings in the boroughs of London, and an abstract of the Local Government legislation of 1900. The charges for water and gas in London are shown, the population of the various provincial Unions is given, and a complete list of all the parks and open spaces for the metropolis, with the Local Authorities controlling them.

The Student's Column.

SANITARY FITTINGS AND PLUMBING.

6.—SINKS (*continued*).

THE name "combined sinks" is often applied to sinks containing more than one compartment, or containing a draining slab in addition to the sink. A double sink is undoubtedly a great advantage, as one compartment can be used for the preliminary washing of the crockery, &c., and the other for the cleaner process of rinsing, and two persons can work at the same time. Such a sink is illustrated in fig. 1, the front of each compartment being fitted with Twyford's inserted wood rim, which prevents damage being done to the enamel by heavy articles, and also reduces the risk of breaking or chipping the crockery which is being washed. One compartment has "snugs" formed for the reception of a draining-board, so that the sink can be used either as a double sink or as a single sink with draining-board. It is made in two sizes, 36 in. by 21 in. by 9½ in., and 48 in. by 21 in. by 9½ in., with raised back as shown, or with a separate back 18 in. high. Combined sinks of very large size are now made, either in one pieee, or in two or more pieces jointed together.

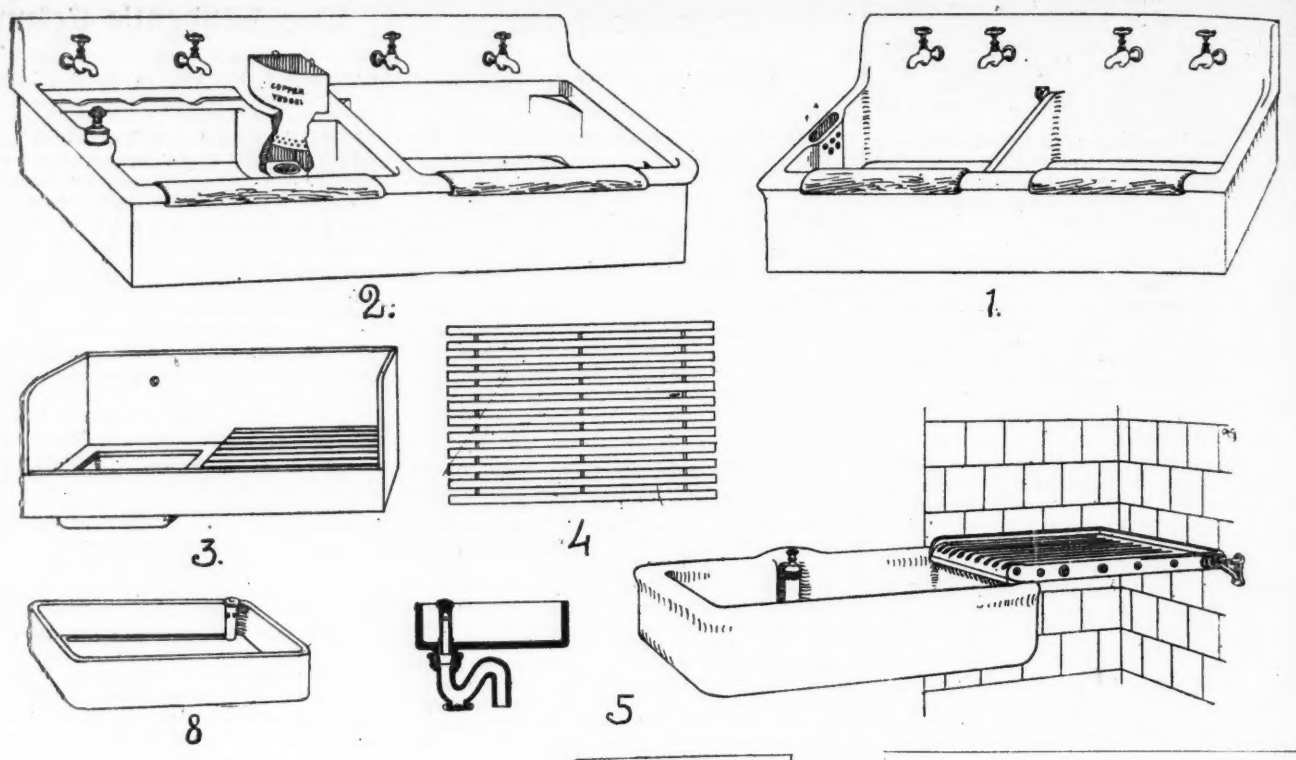
The "Beresford" combined butler's sink (fig. 2) has two compartments, one of which has widely-rounded corners forming seats for the reception of a wood drainer. This compartment has a 2-in. rubber plug with brass washer and union. The other compartment has a "Neros" standing waste and overflow, and a shelf for brushes, &c., is formed along the back. A separate compartment is formed in one corner to receive a perforated copper vessel for holding garbage; this compartment is fitted with a brass grate, so that the water draining from the garbage can escape. The sink measures 5 ft. by 2 ft. by 1 ft. and is made with a raised back as shown, or with a loose back 18 in. high.

A more ordinary form of combined sink is illustrated in fig. 3. This consists of an enamelled fireclay sink (about 22 in. by 18 in. by 13½ in.) with rubbed slate or marble front and skirtings, slate or marble drainer dished to the sink, and teak grating. The sink is fitted with 1½ in. vulcanite plug with brass washer and chain. The number of joints and the square angles formed by the slabs of slate or marble are objectionable features of this kind of sink.

Combined lavatories and sinks are now made in one piece of enamelled fireclay, and are often a convenience in butlers' pantries and other places, but they do not call for detailed notice.

A common complaint with regard to pottery sinks is that they are so hard and slippery that it is practically impossible to avoid breaking or chipping delicate crockery and glass which are being washed up in them. The pottery draining slabs of combined sinks, even when fluted, are a frequent cause of such damage. For this reason the draining slab is now generally covered with a wood grid or fluted drainer, and to prevent damage being done to crockery in the sink itself, the bottom of the sink is fitted with a loose wood grid (fig. 4). These grids are not expensive, and reduce the risk of breakages very considerably; they, of course, become foul sooner or later, and must then be replaced with new ones. The sink with hinged draining board (fig. 5) is one of Shanks's new designs; the sink has a standing waste and overflow, and is supported on galvanised iron legs, and the draining-board is made of separate pieces of wood bolted together.

Undoubtedly the hard and slippery surface of pottery sinks has had much to do with the retention of the wooden sink, either naked o lined with lead or copper. An unlined wooden sink (fig. 6) is specially adapted for washing very fragile articles, such as delicate porcelain ornaments and glassware, which are not seriously fouled, but it cannot be recommended for general work. The best woods for the purpose are birch, sycamore, and teak, but soft woods are sometimes used. The wood should be about 2 in. thick, and framed together with tongue and groove joints made water-tight with red and white lead. The whole should be secured with galvanised iron bolts with nuts and washers. A rounded capping may be fixed on the edges of the sink, and a skirting along the



Illustrations to Student's Column.

back and ends, as shown in part of the illustration. Triangular fillets are sometimes fixed in the angles with brass screws, in order to do away with the sharp corners. They should be thoroughly bedded in red and white lead. The sink may be about 2 ft. 6 in. by 1 ft. 6 in., and from 8 in. to 12 in. or 13 in. deep inside.

Of the two materials generally used for lining wooden sinks, lead is usually preferred on account of its greater softness. The objections to the material are that the bottom piece is apt to form into ridges in consequence of the expansion due to hot water, or to crack in consequence of the subsequent contraction. These defects can be in a great measure obviated by making the bottom piece very stout ; the sides may be of 6 or 8 lbs. sheet lead, but the bottom ought to be of 10 or 12 lbs. lead. A further precaution is to make the sides slope outwards and to fix a feather-edged fillet in the angle, as this gives the lead more freedom for expansion. Sometimes the bottom, sides, and ends are in one piece, so that only the vertical angles need to be soldered, but this method cannot be recommended. More frequently the bottom and two sides are in one piece, and a separate piece is used for each end. When the bottom is of stouter material than the other parts of the lining, the front and one end will be in one piece, and the back and the other end in another piece. The front edge of the sink should be protected by a hard wood weathered capping to prevent the lead being damaged by pails, and the wood bottom should be dished out around the waste-hole, as shown in fig. 7. The vertical angles must be well rounded off with solder, and an overflow grate and pipe must be provided.

Copper is not so much used as lead for lining sinks, although it is more durable. The bottom may weigh 4 lbs. per sq. ft., and the sides about 2½ lbs. The lining is made independently with welted seams, and is then tinned to protect the surface of the copper and at the same time make the seams watertight. It is afterwards fitted into the wooden case. Copper sinks are sometimes hammered out of one piece, but these are of round or oval form, like the bowl of a lavatory ; they ought always to be tinned.

3. *Nursemaids' Sinks.*—These are best made of white porcelain-enamelled fireclay, fitted with waste and overflow, and need not differ in design from some of the butlers' sinks already illustrated.

4. *Vegetable Sinks.*—These sinks are often made of galvanised-iron, or of cast-iron finished in one of the ways mentioned in the last article. They should be about 15 in. or 18 in. deep, so that the dirt can sink below the floating vegetables. The waste may with advantage be placed in a small compartment separated from the body of the sink by a perforated metal strainer, so that grit and garbage will not be carried into the trap. Where soft moorland water is used, the coating of zinc on galvanised iron is soon destroyed, and some other material should be used, such as slate or enamelled fire-clay. The deep fireclay "wash-tubs" are very suitable for the purpose. Two compartments are of service, the one for the preliminary washing and the other for rinsing.

5. *Sinks for Washing Pans, &c.*—Sinks for this purpose are best made of galvanised wrought-iron, or of cast-iron finished black or galvanised. The depth will vary according to the maximum size of the pans in use, and as sand is generally used for scouring the pans, the waste-outlet ought either to be in the side of the sink a little above the bottom, or in a small compartment separated from the body of the sink by a finely perforated metal strainer.

6. *Special Sinks.*—As an example of a special sink, the laboratory sink illustrated in fig. 8 may be given. It has a porcelain standing waste and overflow, so that no metal whatever is exposed to the action of the acids which may be used in the sink. Porcelain traps and waste-pipes are made for use with these and other sinks. Other special sinks are made for the operating rooms of hospitals and for other purposes, but these need not be specially described. Slate sinks are sometimes used for pickling meat, but enamelled fireclay is a better material.

Sink Supports.—Sinks ought not, as a rule, to be enclosed, but the space beneath left open for inspection. Glazed-brick piers or enamelled fireclay pedestals are often used as supports for fireclay sinks, but these form a number of angles with the floor which are difficult to keep clean. It is better to support the sinks on iron or glazed-ware legs or on iron brackets fixed to the wall, so that the floor is not obstructed. Legs and brackets of the kinds mentioned are now supplied by all the leading makers of sanitary fittings. Wood sinks can, of course, be supported on iron or wood brackets or legs.

Wash-tubs.—Wash-tubs are now made in enamelled fireclay, ranging in size from about 24 in. by 20 in. by 15 in. upwards. The fronts generally slope outwards, and should have a roll edge. The backs are often raised. Steeping troughs for laundries can also be obtained in enamelled fireclay up to 7 ft. by 3 ft. 6 in. by 3 ft.

OBITUARY.

MR. J. M. ROBERTSON.—Mr. John Murray Robertson, architect, of Dundee, died on the 31st. ult. at Crossmount House, Perth. Born in Strathord, Mr. Robertson was the son of Mr. James Robertson. His early days were spent at Blair Atholl and Dunkeld, and at the latter place he first went to school. On the death of his father deceased removed with the family to Perth, and was educated at the Free West Church School under the late Mr. James Moir, and latterly at the Perth Academy. In his sixteenth year he entered the office of Mr. Andrew Heiton, the Perth architect, with whom he remained for about fifteen years. Acting in the capacity of assistant architect and Inspector of Works, he first became connected with Dundee district while superintending the erection of Castle Roy, Broughty Ferry, the residence of Mr. A. B. Gilroy, of which Mr. Heiton was the architect-in-chief. Under Mr. Heiton he likewise had to do with the plans of Kinbrae, Newport, the residence of Sir John Leng, M.P., and of Westwood, West Newport. After these and other houses which Mr. Heiton had in hand were well forward to completion, Mr. Robertson resolved to commence business in Dundee on his own account. He quickly succeeded in establishing a large private connexion. While his work was chiefly of the domestic order, he was an architect of wide scope. Some of his principal public and other buildings include the Royal Exchange Shelter, the Caledonian Insurance Company's Buildings, the Caird Maternity Hospital, Fyffe's Buildings in the Nethergate, Lochee Public Baths and Library, the Technical Institute, additions to the University College, the Royal Victoria Hospital, &c., while among numerous private houses of which he was the architect may be mentioned Seathwood, Glamis House ; The Cottage, Lochee ; and The Buchties, Broughty Ferry. Last year there was completed a large addition to Glenstal Castle, County Limerick, of which he was the designer, and there is at present building a large house for a gentleman in Dunblane, the plans of which he prepared. He was likewise architect of the Consump-

tive Home at present in course of erection at Barnhill Perth. Nor was deceased's work confined to villas and large public buildings. Late in the eighties he submitted designs for model houses for working men in a competition in connexion with the Dundee Industrial Exhibition and took the first premium. Mr. Robertson was a Fellow of the Royal Institute of British Architects. To his intimate friends he was known as one of the happiest and most genial of men. Happy always while engaged in the pursuit of his calling, even his holidays were employed in study, and for this purpose he travelled considerably on the Continent, and was familiar with the notable architectural features of many of the principal European cities. His death at the comparatively early age of about fifty-six years will be greatly regretted, not only by all his professional brethren in the city, but by many others to whom he was known, and there will be general sympathy with the widow, son, and daughter by whom he is survived.—*Dundee Advertiser.*

GENERAL BUILDING NEWS.

REOPENING OF CONGREGATIONAL CHAPEL, KELVEDON, ESSEX.—This chapel was reopened on the 23rd ult., after renovation, &c. The old-fashioned, straight-backed pews have been replaced by sloping-backed seats, a pulpit has been erected opposite the gallery, and the organ has been placed behind it. The ceiling has been panelled, and a new front has been made for the gallery. All the new woodwork is of pine. The Sunday school at the rear of the chapel has also been renovated. The work was carried out by Messrs. J. Smith & Son, of Witham, from designs by Mr. Charles Pertwee, of Chelmsford. The organ was removed and repaired by Mr. A. Hurst, of Long Melford; and Mr. J. Polley, of Kelvedon, carried out the lighting arrangements.

CHURCH, CASTLEBAR, CO. MAYO.—The new church at Castlebar is nearing completion. The high altar, and the stained-glass window above, have been placed in position. Mr. Walter G. Doolin is the architect.

INFANTS' SCHOOL, NETTLEHAM, NEAR LINCOLN.—An infants' school has just been opened at Nettleham. It will accommodate ninety scholars. Mr. H. H. Dunn, of Lincoln, was the architect; and Messrs. Bailey & Kirk, of Nettleham, were the builders.

BOARD SCHOOL AT WELLINGBOROUGH.—The new Board school in the Westfield-road, Wellingborough, was opened recently. The school now opened is to take the place of the present boys' school in Rock-street. It has been built from the designs of Mr. J. E. Cutlan, architect, Wellingborough, and has been erected by Messrs. Hacksley Bros., of the same town. The schools are arranged on the central hall system, and are built of red brick with Broseley tile roofs, Sileby facings being used for the south and west fronts, relieved with brick mouldings and Bath stone. Access to the main entrance is from the Westfield-road, and this entrance opens into a vestibule, shut off from the passage leading to the central hall by a glazed screen. Leading from this vestibule is a flight of stairs to the first floor, which contains, besides a landing, a head-master's room, assistant teachers' room, lavatory, and two storerooms, and from this same landing access is also gained to a small balcony overlooking the whole of the central hall and some of the classrooms. Descending to the vestibule and passing through the swing doors in the screen, the scholars will pass to the entrance to the central hall, leaving the cloakroom, &c., to the left. The hall is 39 ft. long, 31 ft. wide, and 27 ft. high. The room is only half its intended length, and indeed the whole building as it stands is only half of what it will ultimately be, it being so arranged that the remaining half will be a duplicate of the present structure. The classrooms on either side of the hall are four in number—two to accommodate sixty children each, and two to accommodate forty children each—and from the south-west end of the central hall entrance is gained to two classrooms accommodating fifty children each, these latter rooms being provided with a sliding glazed partition which enables the two to be thrown into one as occasion requires. The classrooms are treated, so far as the walls are concerned, in similar manner to those of the central hall. The floors of the central hall and classrooms are laid with wood blocks of pitch-pine, the classrooms having galleries of the same material and are furnished with dual desks. The central hall is furnished with two museum cupboards. The classrooms are shut off from the central hall by wooden partitions which are two-thirds glazed. The playground is laid with asphalt, and on the northern boundary are a playshed and a barn, between them being placed the usual out-buildings. At the north-west corner of the buildings there is a flight of steps leading to the basement, which contains the heating apparatus and coal cellars. The heating of the building is by means of hot air, Grundy's system. The classrooms, central hall, and head-master's room are all fitted with electric bells.—*Northampton Reporter.*

FORESTERS' HALL, LEICESTER.—The foundation-stone has just been laid of a Foresters' Dispensary and Institute, which is to be built at a cost of 4,000*l.* in St. Nicholas-street, Leicester. The architect is Mr. A. Wakerly, of Leicester, the contractors being the Leicester Builders, Limited.

ELECTRIC TRAMCAR WORKS, MANCHESTER.—About five acres of land have been purchased in Trafford Park, Manchester, adjacent to the Ship Canal and the Railway Systems, by the British Electric Car Company, of St. Swithin's-lane, London. The works, which are capable of turning out 120 tramway cars at a time, have been designed by Mr. Charles Heathcote, architect, Manchester, and have been commenced.

BANK PREMISES, CAMBERWELL-GREEN.—New premises for the Camberwell branch of the London and County Banking Company, Limited, have been erected on the site of the old police-station at the corner of Camberwell-green and Camberwell New-road. The building is of Ancaster stone, with bands of Belgian blue stone and red bricks. The entrance is at the junction of the Green and Camberwell New-road, and is surmounted by a small tower and dome. There is a suite of rooms for the manager on the upper floors. The whole building will be lighted by electricity. Mr. Alfred Williams was the architect, and Mr. William Shepherd, of Bermondsey, the builder.

PLYMOUTH ROYAL EYE INFIRMARY.—The new building for the Plymouth Royal Eye Infirmary was recently opened. The new infirmary is situated near Mutley Station. It stands on a triangular-shaped piece of land, 1½ acres in extent, and the building faces a new road running westward from Mutley Station. It is in the Later Renaissance style and is built of red bricks, with Doulton stone dressings, and the roofs are covered with Brosely tiles. With regard to the arrangement of the building, the main entrance and administrative block are placed in the centre of the south front. This portion contains a large entrance hall, board-room, office, and matron's room, whilst from the main corridor separate stone staircases ascend to the men's and women's wards on the first floor. The western wing contains the nurses' dining-room, grocery and linen stores, and kitchen department. The dispensary, out-patients' waiting-room, doctors' consulting-room, small operating and ophthalmoscopic rooms are situated in the eastern wing, together with the steward's room, lavatories, and entry and exit lobbies for the out-patients. On the first-floor is the operating-theatre, which is centrally placed and has a large bay-window to give the maximum amount of light without shadows. Two large wards are provided in both the eastern and western wings. These are capable of accommodating fifteen male and fifteen female patients. They are entered from a wide ambulatory corridor, which faces south, and extends the whole length of the building, and is divided by glazed screens. Lavatories, bathrooms, &c., are provided in special wings at the south-east and south-west corners of the building, and there are also linen and clothes cupboards, ward kitchen, and other conveniences. On the second floor is an isolation ward for infectious cases, and bedrooms for the staff and servants, with bathroom, lavatory, linen and store-rooms. Hot-water radiators are placed in the corridors, halls, waiting-rooms, and entrances. The wards are heated by stoves, and patent fireplaces are fixed in the various rooms. Fresh air passages are connected with the radiators, and fresh air is brought in tubes to each fire grate and stove. Extraction shafts are arranged in the roof from the ceilings of the rooms and wards, and continued to air flues in the main chimney stack. The heating apparatus is situated in the basement. The hot-water service for domestic purposes is supplied from a separate boiler in the basement, and is continued through the kitchen department, lavatories, and bathrooms. Fire hydrants are placed on each landing. The building has been wired for electric light, and at present is lighted by incandescent gas. Lifts are arranged for luggage and dinner service to each floor, and in the kitchen from the basement. Electric bells connect the administrative portion with all rooms, and there are telephones for inter-communication on each landing. As the land on which the building is erected falls rapidly from south to north, it was necessary to carry up the foundation walls to a considerable height to bring the ground floor on a level with the new roadway. By the advice of the architects, the committee made the best of this necessary expenditure on the foundations by erecting well-lighted and ventilated cellars under the whole building. Messrs. King & Lester were the architects of the building, and it has been erected under their supervision by Messrs. Lapthorn & Co. The cost, including furnishing, was 16,568*l.* The boundaries are enclosed by wrought iron railing on the south front and by oak fencing on the north-east and north-west fronts.—*Western Morning News.*

SANITARY AND ENGINEERING NEWS.

SEWERAGE SCHEME, DRIGHLINGTON, YORKSHIRE.—On the 30th ult. Mr. R. H. Bicknell held an inquiry at the offices of the Drighlington District Council into an application by the Council to the Local Government Board for a provisional order empowering the Council to put in force, with reference to certain lands required by them for purposes of sewage disposal and situate in the parish of Tong, the powers of the Land Clauses Acts with respect to the purchase and taking of lands otherwise than by agreement. An application by the Council for sanction to borrow 12,660*l.* for carrying out the scheme was also considered. Mr. G. B. Waugh, of Bradford, the engineer for the scheme, stated that he selected site for the sewage disposal works was nearly 6¼ acres in area, and was on the north of the township boundary. It had been selected as there was not a suitable site within the Drighlington district. The drainage would be by gravitation. The site had been recommended four years ago, but was abandoned because of the excessive price the owner of the land wanted for it. The scheme was opposed by Mr. Bairstow, barrister-at-law, on behalf of Sir Robert Tempest, the owner of the land.

STAINED GLASS AND DECORATION.

WINDOW, ST. HILDA'S HOSPITAL, MIDDLESBROUGH.—The two-light window in this hospital has been filled with stained glass as a memorial window. The lower subject, through the two lights, is "Christ Healing the Sick." The upper subjects are, "King Oswy delivering his Daughter to St. Hilda" (A.D. 655), and "Cædman Reciting his Verses to St. Hilda" (A.D. 680). The window is from the studio of Mr. H. A. Hymers, of Chelsea.

WINDOW, ST. ANN'S CHURCH, WANDSWORTH.—A window in the Lady Chapel of this church has been filled with stained glass. The subject chosen is "The Madonna and Child," surmounted with a canopy. The work is from the studio of Mr. H. A. Hymers, Chelsea.

FOREIGN.

FRANCE.—A museum is to be formed in Paris, on the former site of the Ave Maria market, Rue St. Antoine, for the illustration of everything connected with hygiene, and the security of ateliers, shops, and manufactories.——The works for the enlargement of the Port of Dunkerque are to be commenced shortly. The operations will entail an outlay of more than two million francs.——M. Antonin Carlés, the sculptor, is completing the model of the monument to Pasteur to be erected at Dôle (Jura). The design shows a woman embracing two children whose lives have been saved by Pasteur. At her side another female, symbolising Science, raises with an air of triumph a laurel crown towards Pasteur, whose figure, standing in a medit ative attitude, forms the crown of the whole group.——A Committee has been eormed, under the presidency of M. Bonnat, to frect a statue in memory of Antoine Vollon, the eminent painter.——M. Roty has completed a medal in commemoration of the centenary of the Bank of France. Another in honour of the rebuilding of the Théâtre Francais has been modelled by M. Chaplain.——M. Dalou has completed the *maquette* for the monument to Hoche to be erected at Quiberon. On a pedestal cut in the rock the figure of the Republican General is shown standing, his hands crossed on the pommel of his sword.——M. Marceau has completed the statue of Daudet, to be inaugurated this year, and has been commissioned to execute a statue of Dumas *fils*. It represents seated in a realistic costume, while the pedestal is surrounded by the figures of the heroines of his dramas. It is to be erected on the Place Malesherbe, opposite the statue of General Dumas which M. Moncel is modelling.——M. Henri Mayeux has been appointed architect to the National Factory of Sêvres, in place of the late M. Paul Sédille.——M. Henri Nénot, the architect of the Sorbonne, has been promoted to the grade of "Commandeur" in the Legion of Honour. The cross of "Chevalier" has been bestowed on M. Louis Rousseau, architect, of Lous-le-Saunier.——M. Daveley, architect, has been commissioned by the Municipality of Algiers to prepare plans for a large Salle des Fêtes which is to be built in that city, at an estimated cost of a million francs.——It is proposed to entrust to M. Olivier Merson the decoration of the Salle des Cariatides at the Hôtel de Ville. It was to have been decorated by Cabanel, at whose death it was given to Emile Lévy, who also died without having commenced the work. Since then M. Deperthes and M. Formigé have been successively commissioned to study a decorative scheme for this apartment, where the Cariatydes, the work of Cugniot, will probably be replaced by figures of a more decorative character.——The artistic club in the Rue Boissy d'Anglas, known under the double name of the "Union Artistique" or "L'Epatant," always opens at this time of year. The present exhibition has a considerable number of portraits, of which the most striking is that of Cardinal Mathieu by Benjamin Constant, a splendid work. Among the other exhibits are portraits by MM. Humbert, Roybet, Bonnat, &c., as well as interesting works of other classes of subject, by MM. Gervex, Chartran, Bouchon, and René Billotte.

GERMANY.—Excavations in the cathedral at Speyer have now been completed, and a mixed commission appointed by the Bavarian Ministry has met to deliberate on the question as to what is to be done with the human remains discovered. It is noteworthy that the commission consists of leading

artists, architects, and scientific men. Specialists have declared that the remains are those of Conrad II. (who died about 800 years since) and of other Royal personages, and the principal point the commission has to decide is whether these remains shall be replaced, or whether a mausoleum should be erected for their reception. The matter is still under discussion.

INDIA.—The commerce of Calcutta has increased so enormously during the past few years, that considerable difficulty is experienced in dealing with most of it by the several railways, which approach the city but not enter it. *Indian Engineering* states that the problem admits of but one solution, namely, the establishment of unbroken railway communication, by the shortest practicable route, between the eastern and western termini, Calcutta, and the docks, with a central passenger station in the business heart of the city. The matter is engaging the attention of the authorities.——New buildings for the Rangoon College are expected to be completed within the present year; the high, middle, and primary departments will then be separated from the college.——It is estimated that the new military secretariat buildings now under construction in Calcutta will cost eight lakhs of rupees.——The Government of India has sanctioned the erection of a fort at Dargai, the terminus of the Nowshera-Dargai railway.——With the view of mitigating the effect of drought and famine, it is announced that the Viceroy is considering several plans of storing water. It is generally believed by Indian engineers that the proposed great works would be highly beneficial, and reference is made to the successful establishment of the water supply of the city of Nagpur in 1869 by Sir A. R. Binnie.——It is announced that the Lahore railway station has been completed; the cost of the additions and alterations to the Lahore yard is estimated at 78,515 rupees.——The city of Taunggyi, the headquarters station of the superintendent of the Southern Shan States, has been much improved. The drainage has been completed, and amongst its recently constructed public buildings is a school for the relations of the various Shan chiefs and a commodious brick-built bazaar. The houses generally are also of a more permanent character than any which previously existed.——The Government of India has, practically, decided to establish a first-class arsenal at Kirkee.

AUSTRALASIA.—Victorian architects are highly incensed at certain observations recently made by the judge and an engineer during some evidence given in connexion with the Inquiry Board in Melbourne. The gist of the observations was that 90 per cent. of the architects were not worthy of being called professional men. The Council of the Royal Victorian Institute of Architects have, consequently, called upon the Board to give an explanation. It is pointed out that the Institute's examination of the credentials of candidates for membership is very strict; that the Board's stigma cannot possibly refer to them. The remedy suggested is an Act for the registration of architects.——The new municipal buildings at Toowoomba, Queensland, are completed, and were duly opened towards the end of December last.——Plans for a School of Arts building, to be erected at Exeter, New South Wales, are being prepared by Messrs. Slatyer & Cosh, architects, Sydney.——A Roman Catholic church has recently been opened at North Richmond, Victoria; the architect is Mr. G. W. Vanheems, of Melbourne.

MISCELLANEOUS.

APPOINTMENT.—The Secretary of State for India has appointed Mr. William Henry James, B.Sc., Assoc.M.Inst.C.E., professor of civil engineering in the Madras College of Engineering. Mr. James is the present assistant lecturer and demonstrator in engineering at University College, Cardiff.

ELECTRIC LIGHT, MOTHERWELL, EDINBURGH.—On the 1st inst. the installation of electric light, which has been laid down during the past year, was turned on in the principal streets of Motherwell. The scheme, carried out from designs prepared by Professor A. B. W. Kennedy, of London, will cost 30,000*l.*

A SAW-SHARPENING MACHINE.—Messrs. Glover & Co., of Leeds, send a description and illustration of their patent saw-sharpening machine, the advantages of which are thus represented by them:—"The most experienced 'hand-saw sharpener' is obviously only able to file the teeth of the saws quite straight, and, certainly, the frequent liability is for him to file them round, whereas, by means of the circular revolving emery-wheel in this machine, the teeth are compelled to be slightly hollow, like a skate blade. Thus they are rendered much sharper, and cut better, and remain sharp longer than if sharpened by hand By very easily adjustable contrivances all the various 'angles' and 'leads' required in the saw teeth may be secured, and by a 'stop motion' (the emery-wheel lowered to a given point for each tooth) the teeth are accurately sharpened to one height; thus each tooth must do an equal amount of work. In this improved machine 'Glover's Special Emery-Wheels' are used, and the temper of the saws is kept intact by a fine spray of cold water ejected exactly on the tooth being operated upon."

SECTION.

The "Kallio" Sink.

THE "KALLIO" SINK.—A new scullery sink in porcelain enamelled fire-clay, and called the "Kallio" sink, is brought under our notice by the Durrans' Patents Syndicate. The sink appears to have some advantages. Half of the sink contains water in which vegetables or dishes are washed, the overflow passing over a "weir" into a channel where the bits and refuse are collected as the water runs away. Judging from the drawing, the plan is a good one, but it is sometimes difficult to induce the English servant to adopt new methods; still, we think this sink ought to lighten the labour of the thankless and uninteresting "washing-up" process.

GREEK ARCHITECTURE.—At the rooms of the Society for the Encouragement of the Fine Arts, 9, Conduit-street, on the 31st ult., Mr. R. Phené Spiers, F.S.A., delivered a lecture on "Greek Architecture." Dr. Phené, who presided, said the point had arisen whether or not they should postpone the lecture because of the national distress which had overwhelmed them. But he himself had advised that there should be no postponement. Amongst the many things that our late Sovereign took in hand, and mastered, was that of the ornament of architecture, especially as exhibited in the Albert Memorial and in the Mausoleum at Frogmore.—Mr. Spiers then proceeded with his lecture, which was, in the main, a description of an extremely interesting series of lantern views of the leading features of the architecture of Greece, together with some presenting specimens of Greek architecture discovered in the South of Italy. In referring to the Temple of Hera, at Olympia, Mr. Spiers discussed the question as to how it was that the famous statue of Hermes, by Praxiteles, remained undiscovered until about twenty years ago, when it was found buried in the clay of which the temple was built. He inclined to the belief that the walls of the temple, constructed of crude or unburned bricks, lost their roof or protective covering about the fourth century, and so crumbled away, with the result that the statue fell and was buried underneath the débris of the walls, thus escaping the notice of the Romans, who generally took everything, and that of the Christians, who generally destroyed everything.—*Standard.*

NEW CLOCK, BEVERLEY MINSTER.—A very large clock and chimes are being made for the Minster Towers. The clock and chimes will be in the north tower and the hour striking will be done in the south tower upon a bell between five and six tons weight. The work is being carried out by Messrs. Smith & Sons, of Derby, to the designs of Lord Grimthorpe.

COLLAPSE OF A BRIDGE.—On the 31st ult., Buckie Burn-bridge, N.B., which was christened by the Buckie Town Council a few days previously the "Queen Victoria Bridge" collapsed. All night, and, indeed, steadily for a week past, a fierce gale played upon the structure, which was just on the point of leaving the hands of the contractors, Messrs. Stuart & Sons, of Peterhead. The two central piers, built of masonry, hearted with concrete 6 ft. 6 in. broad at the base, tapering to 4 ft. 6 in., collapsed under the strain, there being, it is computed, fully 1,000 tons of superstructure resting on them. The three arches, two of 25 ft. and one of 34 ft., went bodily into the valley 40 ft. below, snapping off like a pipestem at the granite pilasters, and leaving a yawning gulf a hundred feet wide. The débris, consisting of bricks, scaffolding, granite blocks, concrete, stones, and sand, completely choked up the valley and dammed back the Burn, which is in flood, forming a lake 20 ft. deep and extending far up the valley. The contractors began the bridge on August 4 last, and, favoured by the weather, were enabled to make rapid progress. A month ago the Town Council decided to add 3 ft. of extra height to the superstructure, after being approved by the consulting engineer, Mr. Barnett, C.E., of Aberdeen. This had just been done when the disaster happened. The roadway was 45 ft. wide. Each of the smaller arches was circled with three rings of brick, a coating of 6 in. of cement being laid over all, the central span having four rings. Peterhead granite figured largely in the erection.—*Morning Advertiser.*

STREET IMPROVEMENTS, YORK.—The Corporation of York having petitioned the Local Government Board for powers for compulsory purchase in regard to certain properties in Coppergate, Nessgate, and Spurriergate, which they propose to take for the purpose of effecting street improvements, Mr. R. H. Bicknell, M.Inst.C.E., one of the Inspectors of the Local Government Board, held an inquiry in the Guildhall on the 1st inst. The Corporation were represented by the Town Clerk (Mr. W. H. Andrew), the City Surveyor (Mr. A. Creer), and the City Accountant (Mr. Davison). The Town Clerk read the petition, which dealt in detail with the proposed improvements. It was proposed to widen Coppergate, Nessgate, and Spurriergate. After discussion, the inquiry closed.

COCKSPUR-STREET.—The London County Council have recently purchased for, we understand, 100,000*l.* the freehold interest in Nos. 26-7, Cockspur-street, Charing-cross, for the purpose of providing additional accommodation for their staff. At their meeting on November 6 last the Council also agreed, with that same object, to a recommendation made by their Establishment Committee to acquire for 16,250*l.* the interest of the superior lessee in the adjoining premises, No. 25. Nos. 26-7, Cockspur-street were erected for Mr. E. Stanford (who removed thither from No. 55, Charing-cross) in 1888-9 by Messrs. Higgs & Hill, contractors, after the designs of Mr. T. Barnes-Williams. They stand on the site of the "British Coffee House," designed in or about 1770 by Robert Adam, and, as we observed at the time, it is to be regretted that so good an example of the school of the brothers Adam was destroyed. Mr. E. Stanford has opened a new chief establishment in Long Acre, but the sale of the 1-in. and 6-in. Ordnance maps of England and Wales and other maps, together with that of cognate works and publications, will be continued in the front shop of the existing premises in Cockspur-street.

"MODERN OPERA HOUSES AND THEATRES."—Mr. B. T. Batsford announces a second issue of Mr. Edwin O. Sachs' monumental work, "Modern Opera Houses and Theatres," which will be published in the spring. The new issue will contain a special prefatory note dealing with the latest developments and improvements in theatre architecture, not only at home, but in foreign countries.

PRIZES FOR DESIGNS FOR FURNITURE.—The Council of the Society of Arts hold a sum of 400*l.*, the balance of the subscriptions to the Owen Jones Memorial Fund, presented to them by the Memorial Committee, on condition of their spending the interest thereof in prizes to "Students of the Schools of Art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers, and hangings, damasks, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes will be awarded on the results of the annual competition of the Board of Education, South Kensington. Competing designs must be marked "In competition for the Owen Jones Prizes." No candidate who has gained one of the above prizes can again take part in the competition. The next award will be made in 1901, when six prizes are offered for competition, each prize to consist of a bound copy of Owen Jones's "Principles of Design," and the Society's bronze medal. Further particulars may be obtained from the Secretary of the Society of Arts, Sir Henry Trueman Wood, M.A., John-street, Adelphi, W.C.

REFRIGERATION AND COLD STORAGE.—At the City of London College on Wednesday, the 30th ult., Mr. Hal Williams read a paper on "Refrigeration and Cold Storage" before the City of London College Science Society. As the paper was combined with a visit to the cold stores of the Colonial Consignment and Distributing Company, Limited, Nelson's Wharf, Commercial-road, S.E., where modern refrigerating plant was seen at work, the author confined himself to a popular explanation of the principles of refrigeration and the refrigerating machine. Refrigeration means the reduction of a body to a temperature below its normal. The only way this can be done is by bringing the substance to be cooled into contact with a substance already colder than itself. The heat absorbed by the refrigerating substance is, as it were, pumped by the machine to a higher level of temperature, and there discharged into some substance, such as water, which will, while in its natural condition, receive heat from it. Heat cannot be raised from one level of temperature to another without the expenditure of energy in some form or other, so that the heat given up to the cooling water consists of the heat absorbed from the body to be cooled plus the heat representing the work done in raising it to a higher level of temperature. A refrigerating machine is the exact opposite of a heat engine, for in the latter the higher the high temperature and the lower the low temperature, the more efficient the engine, while with the former the lower the high temperature and the higher the low temperature, the more

efficient the machine. The author went on to give a description of the cold-air machine and explained its principles. He then pointed out the qualities of the chief refrigerating agents and explained the characteristics which made their use as a refrigerating medium possible; after this he described the absorption machine and the vapour-compression machine, and—quoting Professor Ewing—said that the absorption machine was from two and a half to three times as efficient as the cold-air machine, and the vapour-compression machine from five to six times as efficient as the cold-air machine, and from two and a half to three times as efficient as the absorption machine. Some remarks were made on the much disputed question of the critical temperature of CO_2, and of the behaviour of that gas under high temperatures; and the paper concluded with a description of the three chief methods of cooling cold stores—viz., by direct expansion of the refrigerating agent in pipes traversing the cold stores; by the circulating in pipes of brine previously cooled by the refrigerating agent; and by the air blast system, in which air is brought into contact with cold brine, is reduced in temperature, and is then circulated through the stores.

STONEHENGE.—The Society of Antiquaries, it is stated, has offered to co-operate with the owner of Stonehenge for its protection.

A NEW PARK FOR TOTTENHAM.—At the next meeting of the Tottenham District Council, it is stated, a contract will be signed for the purchase of a new public recreation ground. The site selected is part of the estate known as "Downhills," and consists of a mansion, its grounds, and three large fields. The whole comprises nearly thirty acres, and although a good deal of neighbouring land has been sold for 1,000*l.* an acre, the price to be paid for the new park is but 800*l.* an acre.

WIDENING OF HAMPSTEAD-ROAD.—A meeting is to be held on Monday, at the Tolmers-square Institute, Drummond-street, at 8 p.m. to advocate the widening of Hampstead-road at its junction with Euston-road. Dr. Collins, of the London County Council, will take the chair. The improvement advocated is one which we consider is really called for.

BUILDING LAND AT WIMBLEDON.—In our advertisement columns will be found the announcement of an approaching sale of a considerable portion of the Wimbledon House Estate. The land included in the present sale is divided into about thirty-five lots of various sizes and positions, suitable for houses of various classes. It is to be hoped that the best will be made of the opportunity to establish a residential district well laid out and occupied by well-built and architectural houses.

CAPITAL AND LABOUR.

THE CARPENTERS' AND JOINERS' DISPUTE' BELFAST.—The annual meeting of the Builders' Association was held at 32, Ann-street, Belfast, on the 29th ult., the proceedings being conducted in private. Mr. J. A. M'Auley, secretary, informed a Press representative, however, that the employers are unanimous in declining to accede to the demands of the men for an increased wage, and are at present well supplied with non-union workmen. A circular has been drafted, and will reach the Carpenters' and Joiners' Union in a few days, giving notice of a material reduction in the rate of pay. In the face of the builders' decision the possibility of a settlement of the dispute, which has now been going on for about nine months, appears very remote. A deputation was appointed by the Union to meet the Association and discuss the situation in the presence of Sir James Haslett, M.P., but matters have been left in abeyance owing to the death of the Queen. The men refuse, after being out nine months, to resume their work at the same rate of wages and hours as previously, but it is stated that they would be willing to accept ¼d. per hour advance in wages, or a promise of such advance, with all the other concessions already promised by the Builders' Association. Failing that, they have the sanction of their governing body to remain on strike till an increase of wages is offered, as well as the hearty support of the other trade societies in the district and throughout Ireland, England, and Scotland, who have from the beginning assisted them financially on a liberal scale. A principal point of difficulty appears to be that of the refusal of the builders to discuss Rule 1, which has reference to wages and hours. The men assert that they are willing to meet the masters in every possible way, and propose that the wages part of the rule should be discussed and the hours omitted, or *vice versa*, as a reasonable compromise.—*Irish News.*

SHEFFIELD PLUMBING TRADE DISPUTE.—This is the fifth week of the plumbers' strike in Sheffield, and as there are no prospects of a settlement, the employers have for the first time made a statement of their position. On June 30 last the operative plumbers gave six months' notice for an advance in wages of ½d. per hour, in order to bring themselves up to the level of some of the building trades. On July 13 the employers, on their part, gave notice for an alteration of rules, in order to bring plumbers under the same conditions of working as other branches of the building trades, and also for a reduction of ½d. per hour in wages. When the rules of the trade were settled some years ago it was agreed, in order to prevent strikes, that in case of any dispute or any request for an alteration of rules, a court of arbitration should be formed, consisting of six employers and six operatives, the decision of this court of arbitration to be final, and binding on both sides. In case of disagreement, an umpire was provided for, and his award should be accepted by both sides. Acting on this rule, the masters asked the operatives to appoint six of their members, and a court was formed. Several conferences were held, but as there was no prospect of an agreement being arrived at, the employers asked for an umpire to be appointed. The operatives declined to agree to this course, stating that unless the demands they had made were agreed to they would strike. In the face of this the masters were unable to proceed further, and a strike commenced at the beginning of the present year. The employers resist the claim of the operatives for the following reasons: 1. Taking into consideration wages and conditions of labour, the Sheffield plumber is as well off, if not better off, than plumbers in any other part of the kingdom, and certainly better off than men engaged in other branches of the building trades in Sheffield. 2. In face of declining trade, and the general state of the labour market, the employers consider it would be unreasonable, not only in their own interests but also in the interest of the public, to give an advance of wages at this time. 3. When the last advance of wages was arranged by the Board of Arbitration, the employers' representatives gave way on the understanding that the operatives would give way on the question of rules as to men going direct to their work instead of to the shop. The employers were very much dissatisfied with the carrying out of this agreement. Leeds and other towns are only paying their men 8½d. per hour, and the workmen there have worse conditions than in Sheffield. Notwithstanding the great inconvenience that has been caused to the public by the strike, the employers have done their best to meet the most urgent demands made upon them, and they have succeeded in securing a goodly number of workmen from other towns to help them out of their difficulty. Of course, some of these "strangers" have returned home again, and it is alleged by the employers that this is the result of the action of the operatives' union. "It is a disgrace to the twentieth century," says one official, "that a man who is able and willing to work to provide for his wife and family should not be allowed to do so, and should have to submit to coercion and intimidation from those who decline to work."—*Sheffield Daily Telegraph.*

DUNDEE JOINERS' WAGES.—A meeting of Dundee Master Joiners' Association was held on the 1st inst. in the office of Mr. Joseph Wilkie, solicitor, the secretary, when the standing by-laws between employers and men were under consideration. Certain modifications were discussed, and ultimately the matter was remitted to the Conciliation Board. The decision of the men at their meeting the previous evening to resist any attempt on the part of the employers to reduce their wages was likewise discussed. The general feeling was that as the spring and summer months advanced a slight reduction in the rate of wages would be necessary, and that the men would be well advised to agree thereto. It was pointed out that in the meantime the rate was the same as that paid in Edinburgh, whereas Dundee was always formerly regarded as paying ½d. per hour less than the rate paid in the capital. No definite decision was come to, and this matter was also remitted to the Conciliation Board.

LEGAL.

SPECIFIC PERFORMANCE OF A BUILDING COVENANT.—IMPORTANT CASE.

THE case of the Mayor, &c., of Wolverhampton *v.* Emmens came before the Court of Appeal on the 1st inst., on the application of the defendant for judgment or a new trial on appeal from verdict and judgment at trial before Mr. Justice Wills and a special jury at the Birmingham Assizes. The action was brought for specific performance of a covenant to build, or in the alternative for damages for breach of that covenant.

It appeared that the plaintiffs, the Corporation of Wolverhampton, conveyed to the defendant, a solicitor, a piece of land in the borough of Wolverhampton, and in that conveyance the defendant covenanted with the plaintiffs that he would commence to erect upon the land within twelve calendar months from May 25, 1897, a new building or buildings of a minimum height of 35 ft. from the pavement to the eaves or parapet, and not more than the height regulated by the by-laws in force in the borough, and would complete the same ready for occupation within two years. The defendant proposed to build on the land eight houses, and submitted plans of the proposed buildings to the plaintiffs, and they were accepted. The defendant afterwards came to the conclusion that, in view of the overbuilt condition of the neighbourhood, it would be impossible for him to make any profit on his building scheme, and he failed to erect any buildings in accordance with his covenant. The plaintiffs then brought the present action against the defendant. The defendant pleaded that it was not a case in which the Court would order specific performance, and paid 40*s.* into court, as being sufficient to satisfy the plaintiffs' claim for damages. Mr. Justice Wills, at the trial, held that the plaintiffs were entitled to a decree for specific performance, but in case the Court of Appeal should consider he was wrong on that point, he left it to the jury to say what damages they considered the plaintiffs were entitled to for the breach of the covenant, and they assessed the damages at 50*l.*

Mr. Jelf, K.C., and Mr. Disturnal appeared for the appellant, and Mr. A. T. Lawrence, K.C., and Mr. R. J. Lawrence for the respondents.

Mr. Jelf contended that it was not a case in which specific performance should have been ordered, as it was not the practice of the Court, except in very exceptional cases, to grant specific performance of a covenant to build. The covenant in question was exceedingly vague, being simply to erect a new building or buildings. Nothing was said as to the number, style, or as to the material to be used. It was not, he submitted, a contract which ought to be specifically enforced. The defendant was willing to pay the 50*l.* damages and the costs of the action and to give back to the Corporation the site he had purchased from them if they would hand him back the 1,000*l.* he had paid for it.

Mr. A. T. Lawrence, for the respondents, argued that it was a proper case for specific performance. If the covenant was indefinite, the contract between the parties had been made definite by the submission and acceptance of plans.

In the result their Lordships unanimously came to the conclusion that it was a case in which specific performance was the proper remedy, and that the judgment of Mr. Justice Wills was quite right.

The application accordingly was dismissed.

Upon the application of Mr. Jelf, and the plaintiffs not objecting, the appellant was given until this time next year in which to carry out his contract.

THE BLUE LIAS LIME PROSECUTION.

THE hearing of the summons issued at the instance of Alfred Andrews, of the Blue Lias Lime-Burners' Association, Medway Wharf, Grosvenor-road, against the Cam Portland Cement Company, Limited, Weldreth, Royston, Cambridge, under the Merchandise Marks Act, was resumed before Mr. Horace Smith at the Westminster Police-court on Wednesday afternoon. The summons charges the defendants with "unlawfully and with intent to defraud applying or causing to be applied to certain goods, namely, four tons of ground hydraulic lime not being Blue Lias Lime, a false trade description as to the place in which the said goods were produced, the mode of producing the same, and the material of which the same were composed, whereby the said goods were falsely described as being Ground Blue Lias Hydraulic Lime, contrary to the provisions of the Merchandise Marks Act, 1887."

At the last hearing it was stated that four tons of lime described on the invoice and on the sacks as "blue lias lime," was obtained from the defendants, but upon examination and analysis it was found that it was not made from the blue and lias rock, a geological formation not known to Cambridgeshire.

Mr. Willis, barrister, again appeared for the prosecution, and Mr. Horace Avory, K.C., defended.

Mr. Bertram Blunt said he was a Fellow of the Chemical Society, a Fellow of the Institute of Chemists, and a member of the Society of Public Analysts, and a member of a firm of analysts having offices at the Broadway, Westminster. He had received a sample of material described as blue lias lime which he had analysed and examined. On being mechanically examined he found it did not present the characteristics of blue lias lime in the way in which it set. Blue lias contained a much greater proportion of actual lime than the material he examined, and correspondingly a smaller quantity of silica and oxide of iron. The specimen he examined contained 51·64 per cent. of lime and 20·98 per cent. of silica, whereas the ordinary amount of these constituents in lime made from blue lias rock were 70·00 per cent. of lime and 12·00 per cent. of silica.

Cross-examined: He was not a geologist, and therefore did not know that the lias formation consisted of five distinct strata which differed entirely from one another. Asked to explain a preponderance of silica in a sample of lime admitted to have been made from the blue lias rock, he stated that it was the result of the workmen not picking out the shale cleanly enough before sending the rock to be burned.

Mr. Avory: Do you say that blue lias lime means something into which no shale or extraneous matter has been introduced?—Yes.

And you do not care what builders and engineers say?—I don't care what builders say, but the opinion of engineers is most valuable.

Do you know that blue lias lime that comes from the district of the blue lias formation does, in fact, contain extraneous matter?—I do not know it.

Mr. George Frederick Deacon, a civil engineer of Westminster and a member of the Council of the Institution of Civil Engineers, said he had used blue lias lime very largely in the construction of reservoirs. Blue lias

me had a definite signification, and was well known to engineers and builders long before any other limes generally known by name, and before Portland cement was known at all. Blue lias lime meant hydraulic lime burnt from the blue lias formation—the lower beds of the lias formation. "Blue lias" as applied to lime was not used as a mere synonym for hydraulic.

Cross-examined: The lias formation included an immense number of bands of rock, none of which were precisely the same. They differed a little in proportion of the materials, but the general proportion of lime was 50 or 60 per cent. It varied from a strong hydraulic lime to a weak hydraulic lime.

Mr. Avory: Is the fact that lime has come from the blue lias formation a guarantee of the hydraulic character of the lime? It is a guarantee of the behaviour of the lime—that is, in its slowly-setting qualities. All lime that comes from the lias formation sets slowly.

In reply to the magistrate, witness stated that he had seen an analysis of a hydraulic lime which set slowly, and it was exactly the same as artificial Portland cement.

Sir Douglas Fox, civil and mechanical engineer, and formerly President of the Institution of Civil Engineers, said the term "blue lias lime" was a definite one to engineers. He could not speak for the builders. He would not accept lime from Cambridgeshire when he had specified blue lias.

Cross-examined: The blue lias lime he had used had been of constant quality and always strongly hydraulic. Bad blue lias could be made, but he always approved of the makers when buying.

Mr. Wm. Gregory, surveyor and estimator to Messrs. Bywaters & Sons, builders, King-street, Regent-street, said the term "blue lias" was well known in the building trade, and had a uniform significance. It was lime burned from the lower beds of the blue lias rock formation. The term was not properly applied when applied to lime made from chalk or marl.

Mr. Frederick Thos. Mullitt, a surveyor, of London and Cambridge, said that there was no blue lias rock in Cambridgeshire. The blue lias formation was run out long before it reached Cambridgeshire. A hydraulic lime was made in Cambridgeshire, but it ought not to be called lime—it was only a sort of poor cement. He would not accept blue lias lime except it came from Warwickshire, Leicestershire, or Nottinghamshire.

Cross-examined: Blue lias lime was made in other places than had been mentioned. For the building trade, blue lias lime, if specified without any qualification or special name, implied blue lias lime from one or other of the three counties he had mentioned. Until that case he had never heard of blue lias lime being made in Cambridgeshire. It was not within his knowledge that blue lias lime had been made and sold in Cambridgeshire for the past ten or fifteen years.

Mr. Alfred William Redding, a member of the firm of Redding & Son, builders, Reading, said he was acquainted with the lime manufactured from materials found in Cambridgeshire. He had never heard the term "blue lias" applied to any lime made there, nor that it was made there from imported blue lias rock.

Cross-examined: He would not go to any place but Leicestershire or Warwickshire for blue lias lime.

Mr. Alfred Wm. Swan, a lime burner, of Cambridge, said he had never heard of blue lias lime being made in Cambridgeshire.

Mr. Avory: They have brought you all the way from Cambridge to say that?

Witness: I suppose so.

This concluded the evidence in support of the complainant's case, and the summons was again adjourned.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

20,056.—BALL AND FLOAT VALVES: *J. Levick.*—The novelty of the invention consists in the adoption of wrought metal instead of cast metal for the studs that join the float-arms and the floats; a stud which is made out of a metal blank is so fashioned that whilst one side of it will screw on to the float-arm the other side will fit on to the float.

20,058.—ATTACHMENTS OF DOOR-KNOBS, &C.: *E. V. Bailey.*—Transverse holes are made in the spindle, a portion of whose length is split. After the pin has been screwed into its place the end of the spindle can be expanded within the neck of the knob. In another form it is arranged that the point of the screw shall enter into the opposite side of the neck of the knob, the point of the pin, instead of its head, being threaded accordingly. The contrivance is available for attaching cupboard turns and similar fastenings to their spindles.

20,061.—JOINTS FOR PIPES, DOORS, &C.: *D. A. Blair, J. B. Blair, & R. Baillie.*—The inventors' object is to provide means of jointing or bolting together the metal flanges or faces around pipes, doors, &c., so that fluid-pressure joints can be easily made or disconnected by the employment of T or other headed bolts and nuts, the nuts and bolts being strung together and pivotted upon a continuous wire or rod. In one modification the bolts are inserted sideways into the bolt-holes that are open at the side outwards, and the rod or wire upon which they are pivotted is coupled or joined with a sliding link or with screw-threaded ends and nuts; the flange joint is to be broken by turning the bolts downwards after the nuts have been loosened.

20,068.—RESISTANCE METERS (ELECTRICAL): *C. Beez.*—With a source of constant current, a rheostat, and a resistance that may be either a 1,000-ohm. standard or the higher resistance which is to be measured, is connected in series a graduated galvanometer which will measure a few millampères, by means of a suitable adjustment of the rheostat the galvanometer will be caused to give its maximum reading with the standard resistance in circuit; then is substituted the resistance which it is required to measure and the diminished deflection of the galvanometer will thereupon show, by means of its graduation marks, the amount of the resistance in question.

20,100.—A SUPPORT FOR ELECTRICAL LAMPS: *M. Railing and J. H. Collings.*—The two halves of a ball fitting are screwed together, and connected electrically with spring plungers, which are mounted within recesses in an insulator bearing in halves upon a circular and a central block. If more than two connexions are needed, the circular block should be divided into segments, and corresponding spring plungers should be supplied. An S-shaped lug projects between the plungers from the insulator, and the supply and lamp wires are secured with screws in the circular and central blocks and the carriers of the plungers.

20,124.—ELECTRICAL APPARATUS FOR GAS LIGHTS: *Soc. Anon. "Lux Nova."*—The gas is lighted and extinguished with an apparatus that comprises separate electro-magnets and circuits. The valve and the sparking contrivance are worked at one and the same time; the spark ignites the main burner, and not an auxiliary burner or pilot jet. With the flow of the current through the electro-magnet of the lighting circuit an armature operates a lever so as to open the gas cock, whilst an insulated disc raises a rod which serves to break circuit at the sparking points; another armature turns the lever in the reversed direction so as to cut off the gas supply, after the current has been caused to pass through the other electro-magnet. An adjustable spring, that bears against the large end of the cock, obviates leakage of gas from the plug cock.

20,132.—AN APPLIANCE FOR SLOTTING HOLES IN DOORS, &C.: *J. Flooks.*—An appliance, to be driven by the hand, for slotting holes in doors and for kindred purposes, consists of a frame which is clamped on to the door, a worm upon the slotting auger gears with two worm-wheels, the wheels being carried by screws which communicate a side feed-motion to the auger.

20,139.—ARTIFICIAL STONE, TILES, BRICKS, &C.: *A. Catkosinski & L. Weintraub.*—The material is composed of an admixture of hydraulic cement and coal waste or slack, and water—the ratio of the cement to the waste being as one to two—and is then ready for being moulded into the shapes desired.

20,166.—A FLOORING CONTRIVANCE: *J. R. Gibbard.*—For joining wooden blocks, and so on, together, and in order to prevent portions of the floor from rising or becoming otherwise displaced the inventor devises some sharp diamond-shaped or double-pointed metal fasteners which are to be driven into the sides and the ends of the blocks or pieces, or the blocks may be slotted to take the fasteners; the fastener should be made with one of its points longer than the other point. In laying the flooring the blunted points of the fasteners are first driven into the blocks.

20,224.—PAINTS AND PIGMENTS: *T. J. O'Sullivan.*—For the making of pigment, a mass of sawdust is saturated with a solution of some iron salt, the compound is then dried and burned. The strength of the iron solution will determine the colour of the resultant pigment.

20,263.—RACK PULLEYS FOR BLINDS: *E. Wareham.*—To the lower portion of the window frame is fixed a cup. Within a slot in the cup is pivotted an arm, at the end of which is a pulley, around which the endless cord of the blind is passed; tension upon the cord is obtained by means of spiral springs that bear against the arm lever and against lugs fixed upon the cup. The invention includes modified applications of the principle involved, and in one shape a spring-arm is substituted for the spiral springs.

20,271 and 20,275.—THE MOULDING OF SINKS, SAGGERS, &C.: *B. Robinson.*—In an extrusion machine used in the making of sinks and similar dished vessels a movable slide, which is fitted upon the mouthpiece, is to be pressed downwards on to the clay or other plastic substance by means of a screw which is turned with a hand-wheel and bevel gearing, the slide being lifted when enough of the material for making the trough of the sink has been pressed out. A wire then cuts off the sink closely against the mouth-piece; a distributing centre is formed upon the mouth-piece, and rollers, or laths affixed to endless bands, serve to support the sink; the side-plates of the die are allowed to open out (being afterwards driven in again with wedges) so as to prevent the back of the sink from bulging inwards just before it is cut off. For shapening the front of the sink a sliding rod, worked with a weight and cord, presses a facing-plate against the mouth-piece, a cranked shaft serving to retain the rod in its position; the front of the sink is supported with plates, which also gauge and regulate its thickness. (20,275.) In the case of Saggers, &c.: The extrusion or pipe-making machine is provided with an adjustable centre and a die-plate with a cutting-rim which trims the edges of the slabs. A lever lifts the table until the plate and the rim come into contact; the clay is pressed through the die that it may unite with a bat or slab of clay which has been laid upon a loose plate on the table, whereupon the table is freed and is pressed downwards by the body of the sagger as it is being forced out; adjustable pipes and an aperture in the core admit air to the inside of the sagger. A slotted die-plate may replace the core and die-plate.

20,316.—CONDUITS FOR ELECTRICAL CONDUCTORS: *W. Sykes.*—The conduits consist of open troughs, made of stoneware, and in single and multiple shapes. The conductors are to be set in bitumen as high up as a rabbet which is fashioned inside the upper parts of the conduits, and will take a cover of cement and sand or bricks after the conductors have been so set. The several lengths are fitted together with their spigot and socket joints and a filling of bitumen, and two adjoining lengths are retained in alignment by means of a shoulder or stud that is formed partly around the socket of one of them.

20,347.—A COMPOSITE MATERIAL: *H. A. Pryor.*—A composite material for use as an artificial stone or marble is made by mixing silicate of soda with milk of lime, and gradually adding Parian or some similar cement to the liquid mixture; then are added mineral colours or other pigments, after which the whole mass is stirred about so as to give it a variegated or veined appearance. The moulded articles, after they have become dry and hard, are taken out of the moulds and rubbed with soft cloths steeped in linseed oil. By another method an admixture of milk of lime, silicate of soda, glycerine, salt, soap, and ground marshmallow root, together with hydraulic cement, gypsum, or some such substance ordinarily employed in the manufacture of artificial stone, is boiled, stirred, and strained through a sieve. The compound can be cast when it is in a liquid state or be moulded when in a plastic condition.

20,351.—ELEVATORS AND HOISTS: *A. C. H. Tiedemann.*—A tubular casing which is put together in sections carries the bucket-band. A frame, in which the motor is fixed, joins the pivots upon which the upper and driving sprocket-wheel rotates. On the motor-shaft is a worm which is set in gear with a worm-wheel upon the shaft and the sprocket-wheel is driven by pinions that are fixed upon the worm-wheel's shaft so as to engage with teeth around the inner side of the sprocket-wheel, the two sides of the bucket-band are drawn together with a guide wheel.

20,377.—BRICKS: *E. W. Beech.*—By this invention, which is described as being quite independent of those set forth in No. 10,258 of 1807 and No. 5,352 of 1899, one side of the brick is fashioned with one dove-tailed groove, or it may be more, so as to ensure a holding or keying with the mortar or plaster; and in order that the bricks may not cut the bricklayer's hands the grooves are made with rounded edges.

20,387.—AN ADHESIVE CEMENT: *F. Sehr.*—A cement which is described as being particularly useful instead of plaster of Paris in the making of electrical glow lamps, and which will serve for cementing glass, porcelain, and, in some instances, metal objects, is made from a paste composed of water-glass, feldspar, and finely pulverised waste fragments of half-burned porcelain and fully-burned hard porcelain.

20,416.—A GRATING FOR DRAINS: *W. R. Hindmarsh.*—The grating is made in a rounded shape, and the top of the side block upon which it rests has a recess which will take the curved grating so as to constitute a common surface with it.

20,423.—A CONTRIVANCE FOR INCANDESCENT GAS BURNERS: *A. Murinick.*—The inventor seeks to provide compensation for variations in the pressure of the gas supply; he arranges the cone-shaped nozzle so that its solid end shall partially close the opening around it. As the gas flows through vertical channels cut around the nozzle it assumes the form of cylindrical films within the chamber above, whence it rises into the mixing tube that is mounted upon springs so as to minimise shocks or vibrations communicated to the mantle. Side draughts are reduced with a pierced disc; and a split tube, to which a nut fastens the support of the mantle, carries the burner head, which is perforated.

20,428.—VALVE-FITTINGS FOR SYSTEMS OF HEATING: *R. G. Brooke.*—The valve-fittings are contrived for circulation pipes and radiators, and are intended to provide means of diverting and otherwise regulating the course and flow of the heating-fluid, whereby some of the radiators, &c., can be placed out of action without interference with the circulation. For that purpose, a tapered plug-valve, having a handle for its adjustment, is put at the junction of the inlet, outlet, and radiator branch pipes, or the junction of those three pipes is regulated with mushroom valves, to which are fitted a screwed spindle and a hand-wheel or lever for their adjustment. In the case of a junction formed by the meeting of four pipes, the circulation is regulated with a suitable plug-cock.

MEETINGS.

FRIDAY, FEBRUARY 8.

Architectural Association. — Mr. D. T. Fyfe on "Architecture in Crete and Turkey." Illustrated by lantern views. 7.30 p.m.

Royal Institution.—Professor G. H. Bryan on "History and Progress of Aerial Locomotion." 9 p.m.

The Institution of Junior Engineers (*Westminster Palace Hotel*).—Mr. Louis F. Awde on "Electric Power Supply in the Metropolis." 8 p.m.

Institution of Mechanical Engineers. — Adjourned discussion on the following paper:—"Power-gas and Large Gas-engines for Central Stations," by Mr. Herbert A. Humphrey. 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. W. Marriott on "Meteorology." 8 p.m.

Institution of Civil Engineers (*Students' Meeting*).—Mr. H. E. Wimperis, B.A., on "Cycle Resistance." 8 p.m.

Glasgow Architectural Craftsmen's Society. — "Wall Coverings," Mr. C. Sinclair on "Limes," Mr. R. W. Horn on "Cements," and Mr. J. Arthur on "Patent Plasters." 8 p.m.

Architectural Association of Ireland (*Technical Demonstrations*).—Mr. B. A. Phillipson on Electric Lighting (10, Lower Baggot-street, Dublin). 4.30 p.m.

SATURDAY, FEBRUARY 9.

Builders' Foremen's Association. — Annual Dinner, King's Hall, Holborn Restaurant.

Dundee Institute of Architecture.—Mr. J. D. Mills on "Warwick and Staffordshire Architecture." 7 p.m.

Edinburgh Architectural Association.—Visit to Royal High School, Canongate Parish Church, and Old Tolbooth.

MONDAY, FEBRUARY 11.

Royal Academy.—Professor Aitchison, R.A., on "St. Peter's." V. 4 p.m.

Surveyors' Institution.—Adjourned discussion on Mr. R. E Middleton's paper on "The Future of the London Water Supply." 8 p.m.

Clerks of Works' Association (*Carpenters' Hall*).—Paper by Mr. H. E. Neale. 8.30.

Bristol Society of Architects.—Mr. C. H. Samson on "Church Restoration." 8 p.m.

TUESDAY, FEBRUARY 12.

Royal Institution.—Professor J. A. Ewing on "Practical Mechanics (experimentally treated): First Principles and Modern Illustrations." V. 3 p.m.

Institution of Civil Engineers.—(1) Paper to be further discussed, "The Present Condition and Prospects of the Panama Canal Works" by Mr. J. T. Ford. (2) Time permitting, Mr. W. J. Weightman on "The Nilgiri Mountain Railway." 8 p.m.

Society of Arts (*Applied Art Section*).—Mr. W. Burton on "Recent Advances in Pottery Decoration." 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*)—Dr. J. Priestley, M.D., on "Sanitary Law." I. 7 p.m.

Edinburgh Architectural Association.—Evening visit to City Observatory.

WEDNESDAY, FEBRUARY 13.

Sanitary Institute.—Mr. Thomas Blashill on "The State of our Streets." The chair will be taken by Sir Alexander Binnie. 8 p.m.

Institution of Civil Engineers.—Students' visit to the Engineering Models at the Victoria and Albert Museum, South Kensington. 2.30 p.m.

Institute of Sanitary Engineers (*Incorporated*).—(1) Examination and Literary Committee at 3 p.m. (2) General Purposes and Finance Committee at 4 p.m. (3) Election Committee at 5.15 p.m. (4) Members' Sessional Meeting at 7 p.m.

Sanitary Institute (*Demonstrations for Sanitary Inspectors*).—Inspection at Lambeth Disinfecting Station, Wanless-road, Loughborough Junction. 3 p.m.

Edinburgh Architectural Society.—Mr. J. A. Arnot on "A Holiday Tour in Belgium and Holland." Illustrated by limelight views.

THURSDAY, FEBRUARY 14.

Royal Academy.—Professor Aitchison, R.A., on "St. Peter's." VI. 4 p.m.

London Institution.—Professor A. C. Haddon, F.R.S., on "The Decorative Art of Primitive Peoples." Illustrated. 6 p.m.

Society for the Encouragement of the Fine Arts.—Mr. J. Offord on "Some recently-discovered Relics of Ancient Art from Western Asia." Limelight illustrations.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley, M.D., on "Sanitary Law." II. 7 p.m.

Institution of Electrical Engineers.—Adjourned discussion on Mr. W. M. Mordey's paper on "Capacity in Alternate Current Working." 8 p.m.

Sheffield Society of Architects and Surveyors.—Mr. H. H. Statham on "Our Cathedral Fronts: A Comparative Criticism." 7 p.m.

FRIDAY, FEBRUARY 15.

Architectural Association.—Mr. E. S. Prior on "Gothic Architecture and the Basis of its Beauty." 7.30 p.m.

Royal Institution.—Professor J. J. Thomson M.A., on "The Existence of Bodies Smaller than Atoms." 9 p.m.

Institution of Mechanical Engineers.—Mr. J. Ashford on "Light Lathes and Screw Machines." 8 p.m.

Sanitary Inspectors' Association. — Annual Dinner, Venetian Chamber, Holborn Restaurant.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley, M.D., on "Sanitary Law," III. 7 p.m.

Architectural Association of Ireland (*Technical Demonstrations*).—Mr. J. Early on "Glass Manufacture." 4.30 p.m. (at 1, Upper Camden-street).

SATURDAY, FEBRUARY 16.

Architectural Association.—First spring visit, to the Roman Catholic Cathedral and Cardinal's House, Ashley Gardens, Victoria-street, Westminster, by permission of the architect, Mr. J. F. Bentley.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 24.—By W. DEW & SON (at Llangefni).
Heneglwys, &c., Anglesey.—The Cefn Coch Estate, 481 a., f. (in numerous lots)..... £19,886

By NEWBON, EDWARDS, & SHEPHARD.

Dalston.—93, Albert-rd., f., r. 34*l.*	£570
Crouch Hill.—5, Blythwood Villas, f., e.r. 55*l.*	690
Peckham.—3, Lanvanor-rd., u.t. 76 yrs., g r. 5*l.*	300
Kensington.—72, Kensington High-st., beneficial lease for 10 yrs., r. 500*l.*	1,020

By WORSFOLD & HAYWARD (at Dover).

Dover, Kent.—St. James's-st., the Bell Inn, f., r. 60*l.*	1,275
2c, St. James's-st., f., r. 20*l.*	275
East Studdale, Kent.—A freehold house, with market garden, orchard, &c., 12 a. 2 r.	270

January 25.—By REYNOLDS & EASON.

Pembrey, Carmarthen.—The Trimsaran Estate, comprising collieries, farms, &c., area, 744 a. 3r. 5p., f., including other mineral rights..	30,500

By HENRY HOLMES & CO.

Marylebone.—44, Charlotte-st., and 44, Goodge-st., f.	4,260
101, Charlotte-st., u.t. 16½ yrs., g.r. 120*l.*, r. 226*l.*	195
Harrow, Middlesex.—4, Marlborough Hill, u.t. 68 yrs., g.r. 9*l.*, r. 40*l.*	400

By ROBERT REID.

Kensington.—7, Brunswick-gdns., f., r. 112*l.*	1,885
Paddington.—7, Oakington-rd., u.t 62 yrs., g.r. 6*l.*, r. 40*l.*	430

By ROBINS, GORE, & MERCER.

Kentish Town.—178, Kentish Town-rd., u.t. 15 yrs., g.r. 85*l.*, r. 120*l.*	300

By VENTOM, BULL, & COOPER.

Maida Vale.—7, Randolph-gdns., u.t. 50 yrs., g.r. 10*l.*	585
Dulwich.—22 and 24, Elsie-rd., u.t. 72 yrs., g.r. 13*l.*, r. 68*l.*	630

January 28.—By FIELD & SONS.

Rotherhithe.—33, 39, and 41, Hawkstone-rd., u.t. 50 yrs., g.r. 11*l.* 10s.	715

By FISHER, STANHOPE, & DRAKE.

West Ham.—25 to 35 (odd), and 39, Brownswood-villas, u.t. 78 yrs., g.r. 35*l.*	1,500
Stoke Newington.—40, Clissold-rd., u.t. 47½ yrs., g.r. 7*l.*, e.r. 55*l.*	500
Stamford Hill.—13, East Bank, u.t. 84 yrs., g.r. 7*l.*, e.r. 50*l.*	630

By DYER, SON, & HILTON.

Twickenham, Middx.—St. Margaret's-rd., Durham Lodge and Earlham, u.t. 81 yrs., g.r. 20*l.*, r. 97*l.* 10s.	900

By WILKINSON, SON, & WELCH (at Brighton).

Brighton, Sussex.—8, Grand Junction Parade, f., r. 150*l.*	2,100

January 29.—By HUNTER & HUNTER.

Chelsea.—33, Redesdale-st., u.t. 51½ yrs., g.r. 6*l.*, r. 55*l.*	600
Clapham.—37 and 39, Haselrigge-rd., u.t. 61 yrs., g.r. 10*l.* 12s., r. 70*l.*	715

By WALTER SIMMONDS.

Peckham.—13, 14, and 15, Pitt-st., u.t. 12½ yrs., g.r. 9*l.* 9s.	240
Walworth.—44, Heygate-st., u.t. 42 yrs., g.r. 5*l.*, r. 38*l.*	390
Camberwell.—9, Selborne-rd., u.t. 62 yrs., g.r. 5*l.* 10s., r. 30*l.*	390
34, Sedgmoor-pl., u.t. 13¼ yrs., g.r. 4*l.*	110
Camden Town.—35 and 36, Rochester-sq., u.t. 45½ yrs., g.r. 10*l.*, r. 80*l.*	885

By FREDERICK WARMAN.

Regent-st.—6, King-st., f., r. 100*l.*	2,675
Marylebone.—39, Fitzroy-sq., beneficial lease for 12½ yrs., r. 140*l.*	200
Camberwell.—117, 119, 121, and 123, New Church-rd., f., r. 104*l.*	1,100
Highbury.—56, Highbury New Pk., u.t. 48½ yrs., g.r. 10*l.* 10s., e.r. 80*l.*	800
Walworth.—42, 44, and 46, East-st., f., r. 123*l.*	1,650

By WOOTTON & GREEN.

Wandsworth-rd.—No. 369, f., e.r. 60*l.*	850

By WYATT & SON (at Havant).

North Hayling, Hants.—Eastney Farm, 88 a. 3r. 29 p., f.	2,000
Gutner Farm, 59 a. 1 r. 16 p., f.	630
Two houses, cottages, and 1r. 26 p., f.	550
Lea Gardens and Grove's Fields, 14 a. 0 r. 36 p., f.	400

January 30.—By PHIBBS GIBSON & CO.

Dulwich.—12, Park-rd., u.t. 32 yrs., g.r. 9*l.* 10s.	450

By R. TIDEY & SON.

Holloway.—38, Bickerton-rd., u.t. 75 yrs., g.r. 6*l.* 10s., r. 38*l.*	380
Highbury.—125, Riversdale-rd., u.t. 69 yrs., g.r. 7*l.*, r. 40*l.*	380

By WAGSTAFF & SONS.

Holloway.—17, 19, 21, and 23, Eden-grove, f., r. 167*l.*	2,320
Canonbury.—58, Canonbury-rd., u.t. 17½ yrs., g.r. 5*l.* 10s., r. 45*l.*	235
13, Alwyne-villas, u.t. 17½ yrs., g.r. 6*l.*, r. 36*l.*	210

By T. G. WHARTON.

Fulham.—Bronsart-rd., f.g.r.'s 75*l.*, reversion in 97 yrs.	1,900

By BALCH & BALCH (at Camden Town).

Holloway.—3, Penn-rd.-villas, u.t. 42 yrs., g.r. 8*l.*, e.r. 48*l.*	450
61, Cromwell-rd., u.t. 64 yrs., g.r. 1*l.*, r. 25*l.*	205
St. Pancras.—3, Goldington-crescent, u.t. 48½ yrs., g.r. 20*l.*	325
74, 76, 78, 80, 86, and 88, Euston-st., u.t. 18½ yrs., g.r. 107*l.* 2s., r. 291*l.*	820
27, Werrington-st., u.t. 48 yrs., g.r. 10*l.*, e.r. 46*l.*	350
4 and 5, Crawley-mews, u.t. 42 yrs., g.r. 2*l.*	255

By HARDS & BRADLY (at Bromley).

Bromley, Kent.—3, Ravensbourne-rd., f., e.r. 55*l.*	650

January 31.—By NORTON, TRIST, & GILBERT.

Battersea.—Battersea-rise, Tower Cottage, area 5,000 ft., f.	1,100
Chelsea.—15, Royal-avenue, u.t. 39 yrs., g.r. 7*l.*, r. 70*l.*	700
Canonbury.—21, Canonbury-villas, u.t. 61½ yrs., g.r. 8*l.*, r. 48*l.*	270

By A. PREVOST & SON.

Mile End.—93, 95, and 97, Skidmore-st.; also l.g.r. 1*l.* 10s., u.t. 16 yrs., g.r. 8*l.* 17s.	105
Plaistow.—Surrey-st., a plot of building land, f.	160

By JOSEPH STOWER.

High Ongar, Essex.—Nine Ashes, Box Cottage, f.	280
Hoxton.—32, Baring-st., u.t. 31½ yrs., g.r. 3*l.* 15s., r. 32*l.*	

February 1.—By PERCY H. CLARKE.

Putney.—Roehampton-lane, Ellenborough House and 6a. 3r. 38p., f., r. 250*l.*	£5,600
Kensington.—40, 41, 42, and 43, Victoria-rd., u.t. 19 yrs., g.r. 21*l.*, r. 435*l.*	4,120
Richmond.—12, Pagoda-avenue, u.t. 92½ yrs., g.r. 10*l.*, r. 50*l.*	420
43, Selwyn-avenue, u.t. 92½ yrs., g.r. 7*l.*, r. 36*l.*	310

By DOLMAN & PEARCE.

Notting Hill.—10, Ladbroke-gardens, u.t. 66 yrs., g.r., &c., 23*l.* 1s., r. 100*l.*	1,020

By E. & S. SMITH.

King's Cross.—33, Dennis-st., u.t. 41 yrs., g.r. 6*l.*	280
Holloway.—10, Anatola-rd., u.t. 68 yrs., g.r. 6*l.*	265
Muswell Hill.—Muswell-rd., Fairview, u.t. 82 yrs., g.r. 10*l.* 10s., e.r. 45*l.*	410

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.			
Hard Stocks	1 15 0	per 1,000	alongside,	in river.
Rough Stocks and Grizzles	1 12 0	,,	,,	,,
Smooth Bright Facing Stocks...	2 18 0	,,	,,	,,
Shippers	2 8 0	,,	,,	,,
Flettons.....	1 9 0	,,	,,	,,
Red Wire Cuts ..	1 15 6	,,	,,	,,
Best Fareham Red	3 11 6	,,	,,	,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,,	,,
Best Blue Pressed Staffordshire ..	4 7 0	,,	,,	,,
Do., Bullnose	4 12 0	,,	,,	,,
Best Stourbridge Fire Bricks	4 4 6	,,	,,	,,
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,,	,,
Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,,	,,
Double Stretchers	19 0 0	,,	,,	,,
Double Headers..	16 0 0	,,	,,	,,
One Side and two Ends	19 0 0	,,	,,	,,
Two Sides and one End	20 0 0	,,	,,	,,
Splays, Chamfered, Squints	20 0 0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	14 0 0	,,	,,	,,
Double Stretchers	15 0 0	,,	,,	,,
Double Headers..	14 0 0	,,	,,	,,
One Side and two Ends	15 0 0	,,	,,	,,
Two Sides and one End	15 0 0	,,	,,	,,
Splays, Chamfered, Squints	14 0 0	,,	,,	,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.	

	s. d.		
Thames and Pit Sand	7 6	per yard,	delivered.
Thames Ballast	6 3	,,	,,
Best Portland Cement	38 0	per ton	,,
Best Ground Blue Lias Lime..	25 6	,,	,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 13s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 32s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube,	deld. rly. depôt.
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 1½	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4½	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 3 in. self-faced Ditto	0 9½	,,	,,

SLATES.

in.	in.	£ s. d.	
20	10 best blue Bangor...	11 5 0	per 1000 of 1200 at ry. dep.
,,	best seconds	,, 10 15 0	,, ,,
16	8 best	,, 6 2 6	,, ,,
20	10 best blue Portmadoc	10 18 0	,, ,,
16	8 best blue Portmadoc	6 0 0	,, ,,
20	10 best Eureka unfading green.....	11 2 6	,, ,,
16	8 ,, ,,	6 15 0	,, ,,
20	10 Permanent green	10 0 0	,, ,,
16	8 ,, ,,	5 12 6	,, ,,

[*See also page 149.*

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Sewerage Scheme	Basford R.D.C.	Not stated	Mar. 25

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Granite Road Metal	Lutterworth R.D.C.	J. C. Coates, Surveyor, Lutterworth	Feb. 12
Street Works, Duke-street	Mansfield Corporation	R. F. Vallance, Borough Surveyor, Mansfield	do.
Pipes, &c. (3 miles)	Glasgow Corporation	W. A. Chamen, Engineer, 75, Waterloo-street, Glasgow	do.
Three Blocks of Houses, Shaw Cross	Dewsbury Industrial Society, Ltd.	Holtom & Fox, Architects, Dewsbury	do.
Additions to Cottage, Aberlour, N.B.		C. C. Doig, Architect, Elgin	do.
Additions to Dolphin Inn, Market-square	Coventry Corporation	J. E. Swindlehurst, Engineer, St. Mary's Hall, Coventry	do.
Two Bridges, Kintbury, Berks	Great Western Railway Company	G. K. Mills, Paddington Station, W.	do.
Pipe Sewer, &c.	Pokesdown (Hants) U.D.C.	W. E. Burt, Council Offices, Pokesdown	do.
Additions to No. 3, Sea View, Bridlington	Mr. E. T. Jackson	J. Earnshaw, Architect, Wellington-road, Bridlington	do.
Portland Cement, Gravel, &c.	Salford Corporation	L. C. Evans, Town Hall, Salford	do.
Portland Cement, Lime, Sand, &c.	Dublin Corporation	S. Harty, Borough Surveyor, City Hall, Dublin	do.
Wrought-iron Ornamental Railings, &c.	Wallasey U.D.C.	W. H. Travers, Engineer, Public Offices, Egremont, Cheshire	do.
*Electric Light Station	Whitby U.D.C.	Clerk, Council Offices, Whitby, Yorks	do.
*Kerbing and Tarpaving, &c., Wearside-road	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford, S.E.	do.
*Kerbing and Tarpaving, &c., Treviso-road	do.	do.	do.
*Kerbing and Tarpaving, &c., Kemble-road	do.	do.	do.
*Kerbing and Tarpaving, &c., Vestris-road	do.	do.	do.
*Works and Materials	Willesden District Council	Engineer, Council Offices, Dyne-road, Kilburn, N.W.	do.
Road Materials	Birkenhead Corporation	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	Feb. 13
Road Materials	East Retford R.D.C.	T. Henry, Surveyor, Retford	do.
New Streets, Dowlais, South Wales	Mr. E. Davies	W. Dowdeswell, Architect, John-street, Treharris	do.
Shop, New Malden, Surrey		V. Davison, jun., Civil Engineer, Bartley Lodge, New Malden	do.
Thirty-two Dwellings	North Dublin R.D.C.	J. O'Neill, North Brunswick-street, Dublin	do.
Street Works	Harrington (Cumberland) U.D.C.	C. W. Eaglesfield, Surveyor, Council Offices, Harrington	do.
Additions to Police Station, Port Talbot	Glamorgan County Council	County Surveyor, Bridgend	do.
Storage Reservoir, Drumbowie	Falkirk, &c., Water Trustees	W. R. Copland, Civil Engineer, 146, West Regent-st., Glasgow	do.
Offices, Dean-street	Scarborough Guardians	Runton & Barry, Architects, Scarborough	do.
*Alterations and Additions to St. Nicholas House	Scarborough Town Council	Borough Engineer, Town Hall, Scarborough	Feb. 14
Sewers, Inner Leven, Kirkcaldy	Fife County Council	W. D. Sang, Civil Engineer, Kirkcaldy	do.
School, Higher Cloughfold, Lancs.	Baptist Chapel Trustees	A. Coates, Sunny Lea, Rawtenstall	do.
Storage Reservoir, &c., Blarbuie Burn	Lochgilphead Town Council	J. L. Proudfoot, Civil Engineer, 95, Bath-street, Glasgow	do.
Fireclay Goods, Bricks, &c.	Belfast Corporation	Sir S. Black, Town Hall, Belfast	do.
Alterations to Business Premises, Spring Bank	Darwen (Lancs) Indus. Co-op. Soc.	J. B. Thornley, Architect, Darwen	do.
Additions to Brewery, Bradford-on-Avon	Harding & Co., Ltd.	W. H. Stanley, Civil Engineer, Trowbridge	do.
Additions to Church, Burnage, Manchester		Austin & Paley, Architects, Lancaster	do.
Offices, Limerick	Irish Co-op. Agency Soc., Ltd.	B. E. F. Sheehy, Civil Engineer, 13, William-street, Limerick	Feb. 15
Masonic Hall, Salisbury		A. C. Bothams, Architect, 32, Chipper-lane, Salisbury	do.
Engines, Dynamos, and Boilers	Stirling Town Council	Kennedy & Jenkin, Engineers, 17, Victoria-street, S.W.	do.
Pipe Sewers (2,550 yards), &c.	Oakworth (Yorks) U.D.C.	Barber, Hopkinson & Co., Engineers, Keighley	do.
Water Tank, &c., Bottle Hill	Plympton St. Mary R.D.C.	F. E. T. Cleverton, 4, Buckland-terrace, Plymouth	do.
Lime	Wolverhampton Corporation	W. Clifford, Sewage Outfall Works, Wolverhampton	do.
Granite, Kerbs, Road Metal, &c.	Plymouth Corporation	J. Paton, Borough Engineer, Municipal Offices, Plymouth	Feb. 16
Bricks, Pipes, &c.	Torquay Corporation	W. Ingham, Civil Engineer, Torquay	do.
Broken Granite, &c. (10,100 tons)	Holland (Lincs) County Council	H. C. Johnson, Sessions House, Boston	do.
Sewers	Evesham Corporation	R. E. W. Berrington, Civil Engineer, Wolverhampton	do.
Flint Road Metal	Headington (Oxon) R.D.C.	L. Turner, Surveyor, New Headington	do.
Granite Setts, &c.	Accrington Corporation	W. J. Newton, Civil Engineer, Town Hall, Accrington	do.
Church Restoration, Hampsthwaite, near Harrowgate		C. H. Fowler, Architect, The College, Durham	do.
Paving Setts, Cements, Bricks, &c.	Blackburn Corporation	W. Stubbs, Civil Engineer, Municipal Offices, Blackburn	do.
Gasholder Tank, Pipes, &c., Isle of Man	Port Erin, &c., Gas Company	T. Newbigging & Son, Engineers, 5, Norfolk-street, Manchester	do.
Purifiers, House, &c., at Gasworks	Walsall Corporation	B. W. Smith, Engineer, Pleck Gasworks, Walsall	do.
Surveyors' Materials	Bootle (Lancs) Corporation	Borough Engineer, Town Hall, Bootle	do.
Broken Granite (9,000 tons), Slag, &c.	Spilsby (Lincs) R.D.C.	T. A. Busbridge, Civil Engineer, Spilsby	do.
*Sewerage Works	Hornsey U.D.C.	Engineer, Council Offices, Southwood-lane, Highgate, N.	Feb. 18
Surveyors' Materials	Herts County Council	U. A. Smith, Surveyor, 41, Parliament-street, S.W.	do.
Well	Brigstock (Northants) P.C.	J. Chadwick, Civil Engineer, Bletchley	do.
14 Houses, Hampton-street, Wrexham		E. Hanmer, 37, Penybryn, Wrexham	do.
Additions to Electricity Works	Canterbury Corporation	City Surveyor, High-street, Canterbury	do.
Electrical Plant	Long Eaton U.D.C.	F. Worrall, Civil Engineer, Council Offices, Long Eaton	do.
Pipes, Storage Tank, &c.	Wimbledon U.D.C.	F. B. Spencer, Council Offices, Durnsford-road, Wimbledon	do.
Laying-out Grounds, Ayresome Grange, Middlesbrough		J. Robson, Hintons Buildings, Albert-road, Middlesbrough	do.
Earthenware Pipe Sewers, &c., Irthlingborough	Wellingborough R.D.C.	Ives & Waugh, Engineers, Sunbridge Chambers, Bradford	do.
Borehole, Horsehay, Dawley, Salop		T. S. Stooke, Civil Engineer, Port Hill-road, Shrewsbury	do.
*Sewering, Draining, &c.	Hendon U.D.C.	Engineer, Public Office, Hendon, N.W.	do.
*Materials, &c.	do.	do.	do.
*Alterations to Southern Portion of Holton Bridge	Heading R.D.C.	See Advertisement	Feb. 19
Heating Works at School, Manselton	Swansea (U.D.) School Board	G. E. T. Laurence, Architect, 22, Buckingham-street, W.C.	do.
School, Thoresby-street	Kingston-upon-Hull School Board	Brodrick & Co., Architects, Lowgate, Hull	do.
*Making-up Roads	Fulham Borough Council	Surveyor, Town Hall, Walham Green, S.W.	Feb. 20
Church, Blairgowrie		D. & R. J. Macmillan, Architects, 211, Union-street, Aberdeen	do.
Alterations to Mortuary	Devonport Town Council	Borough Surveyor, 30, Ker-street, Devonport	Feb. 21
Steel Rails, &c. (3,000 tons)	Glasgow Corporation	J. Young, 88, Renfield-street, Glasgow	Feb. 22
Buildings in Railway-street, Armagh		H. C. Parkinson, Architect, 11, College-street, Armagh	do
*Making-up Roads	Wood Green U.D.C.	Surveyor, Town Hall, Wood Green	do.
*Granite, &c.	do.	do.	do.
*Underground Convenience	Walthamstow U.D.C.	Engineer, Town Hall, Walthamstow	do.
Road Metal, Lewes	East Sussex County Council	F. J. Wood, Civil Engineer, County Hall, Lewes	Feb. 23
Sewers	Withington (Lancs) U.D.C.	A. H. Mountain, Civil Engineer, Withington	Feb. 25
*Culvert	Bristol Sanitary Committee	City Engineer, 63, Queen-square, Bristol	Feb. 27
Road Materials	Hailsham R.D.C.	J. Huxley, Civil Engineer, 9, Wellington-terrace, Hailsham	do
*Laundry Buildings	Isle of Thanet Guardians	L. Grant, Architect, High-street, Sittingbourne	do.
*Administrative Block at Workhouse Infirmary	Sheffield Guardians	Union Offices, Westbar, Sheffield	Feb. 28
*School Buildings	Wrexham County Schools	See Advertisement	do.
*Shops, &c.	Walthamstow Parochial Charities	W. A. Longmore, Archt., Bridge Chmbrs., Hoe-st., Walthamstow	do.
*Balmoral Hotel at Felixstowe, Suffolk	Hon. Douglas A. Tollemache	See Advertisement	Mar. 4
Deep Boring, Boultham	Lincoln Corporation	P. Griffith, Civil Engineer, 54, Parliament-street, S.W.	do.
Portland Cement, &c.	Wolverhampton Corporation	J. W. Bradley, Civil Engineer, Town Hall, Wolverhampton	do.
Surveyors' Materials	South Shields Corporation	S. E. Burgess, Civil Engineer, Chapter-row, South Shields	Mar. 6
Sewerage Works	Cannock (Staffs) U.D.C.	C. L. Whitehead, Civil Engineer, Cannock	Mar. 7
*Extension and Completion of Infirmary	Camberwell Guardians	See Advertisement	Mar. 13
Residence, Copse Hill, Scotby, Carlisle	Mr. E. Carr	Johnstone Bros., Architects, 39, Lowther-street, Carlisle	No date
Gravel Road Metal	Bosmere & Claydon R.D.C.	J. J. White, Civil Engineer, High-street, Needham Market	do.
Block of Shops, Botchergate, Carlisle	Mr. J. Harrison	J. Graham, Architect, Bank-street, Carlisle	do.
House, Croft Mitchell, Camborne		J. Retallack, Croft Mitchell	do.
Ten Houses, Horsforth, near Leeds	Messrs. Harding & Co., Ltd.	G. F. Bowman, Architect, 5, Greek-street, Leeds	do.
Alterations to Tower Works, Leeds		W. Bakewell, Architect, 38, Park-square, Leeds	do.
Stable, &c., Woodhouse, Leeds		F. Mitchell, Architect, 9, Upper Fountain-street, Leeds	do.
School, Hooley Hill, Audenshaw, Lancs.		Burton & Percival, Architects, Ashton-under-Lyne	do.
Earthwork Embankments, Castle Eden, Durham		Secretary, Horden Collieries, Ltd., Shotton Colliery, Castle Eden	do.

[See also next page.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Grimsby School Board	3*l.* 3*s.* per week	Feb. 11
*Draughtsman	Hackney Borough Council	2*l.* 2*s.* per week	Feb. 15
Assistant Surveyor	Smethwick Town Council	120*l.* per annum	Feb. 19
*City Engineer and Surveyor	Westminster City Council	1,000*l.* per annum	Mar. 2

Those marked with an asterisk (*) are advertised in this Number. Competitions, p.—. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xviii. & xxi.

PRICES CURRENT (*Continued*).

TILES.

	s.	d.			
Best plain red roofing tiles	41	6	per 1,000	at rly.	depôt.
Hip and valley tiles	3	7	per doz.	,,	,,
Best Broseley tiles	48	6	per 1,000	,,	,,
Hip and valley tiles	4	0	per doz.	,,	,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000	,,	,,
Do. ornamental Do.	60	0	,,	,,	,,
Hip tiles	4	0	per doz.	,,	,,
Valley tiles	3	9	,,	,,	,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000	,,	,,
Hip tiles	4	1	per doz.	,,	,,
Valley tiles	3	8	,,	,,	,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	16 10 0	18 0 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	12 10 0	13 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
	At per load of 50 ft.	
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch pine timber (35 ft. average)	4 0 0	4 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	27 10 0	28 10 0
3 in. by 9 in.	24 0 0	25 0 0
Battens, 2½ in. and 3 in. by 7 in.	20 0 0	21 0 0
Second yellow deals, 3 in. by 11 in.	22 10 0	24 0 0
,, ,, 3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	16 10 0	18 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
Do. 3 in. by 9 in.	22 0 0	23 0 0
Battens	16 10 0	17 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	14 0 0	14 10 0
Third yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	14 10 0
Battens	12 10 0	13 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 10 0	16 10 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 10 0	13 10 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	11 0 0	12 0 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 2 8
Small ,, ,,	0 2 4	0 2 7
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 9
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 2 3	0 3 0

JOISTS, GIRDERS, &c.

	In London, £ s. d.	or delivered to Railway Vans, per ton. £ s. d.
Rolled Steel Joists, ordinary sections	8 0 0	9 0 0
Compound Girders ,, ,,	9 10 0	10 15 0
Angles, Tees and Channels, ordinary sections	9 12 6	11 12 6
Flitch Plates	10 0 0	10 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	8 5 0	10 0 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	9 10 0	- - -
Staffordshire Crown Bars, good merchant quality	9 15 0	10 0 0
Staffordshire "Marked Bars"	11 10 0	- - -
Mild Steel Bars	9 10 0	10 10 0
Hoop Iron, basis price	10 5 0	10 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 15 0	- - -
,, ,, to 24 g.	11 15 0	- - -
,, ,, to 26 g.	13 5 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	13 0 0	- - -
,, ,, 22 g. and 24 g.	13 15 0	- - -
,, ,, 26 g.	15 10 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	17 0 0	- - -
,, ,, 22 g. and 24 g.	17 10 0	- - -
,, ,, 26 g.	19 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	13 0 0	- - -
,, ,, 22 g. and 24 g.	13 10 0	- - -
,, ,, 26 g.	14 0 0	1 10 0
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	- - -
,, ,, 22 g. and 24 g.	14 0 0	- - -
,, ,, 26 g.	15 0 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	11 10 0	- - -
LEAD—Sheet, English, 3 lbs. & up.	18 15 0	- - -
Pipe in coils	19 5 0	- - -
Soil Pipe	22 5 0	- - -
ZINC—Sheet—		
Vieill6 Montagne ton	26 0 0	- - -
Silesian	25 10 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 1	- - -
Thin ,,	0 1 3	- - -
Copper nails ,,	0 1 3	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4½	- - -
SOLDER—Plumbers' ,,	0 0 9	- - -
Tinmen's ,,	0 0 9½	- - -
Blowpipe ,,	0 0 10½	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, ,, fourths	3d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, ,, fourths	4d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, ,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, ,, 21 ,,	4¼d. ,, ,,
⅛ Hartley's Rolled Plate	3d. ,, ,,
⅜ ,, ,, ,,	3½d. ,, ,,
½ ,, ,, ,,	4d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Boiled ,, ,, in pipes	,,	0 3 1
,, ,, ,, in barrels	,,	0 3 2
,, ,, ,, in drums	,,	0 3 4
Turpentine, in barrels	,,	0 2 8
,, in drums	,,	0 2 10
Genuine Ground English White Lead	per ton	27 0 0
Red Lead, Dry	,,	24 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALFRISTON (Sussex).—For alterations to The Star inn, for Messrs. Page & Overton, Limited. Mr. A. Broad, architect, 22, George-street, Croydon:—

Peerless, Dennis, & Co.	£568	M. Hookham, Eastbourne*	£370

CROYDON.—For three houses, Temple-road. Mr. A. Broad, architect, 22, George-street, Croydon:—
J. J. Cooper, Sutton* £1,800

CROYDON.—For alterations to No. 96, Church-street, for Messrs. J. Thrift & Sons. Mr. A. Broad, architect, 22, George-street, Croydon:—

Smith & Son	£525	Pearson & Co.	£460
Akers & Co.	523	W. Potter*	450

HIGH WYCOMBE. — For new billiard-room and additions, Hill Side. Mr. Arthur Vernon, architect, 29, Cockspur-street, London, S.W., and High Wycombe:—

Hunt & Son	£1,365 0 0	G. H. Gibson*	£1,265 0

LEWES (Sussex).—For alterations to The Fountain inn, for Messrs. Page & Overton, Limited. Mr. A. Broad, architect, 22, George-street, Croydon:—

J. Floyd	£320	W. Wells	£268
M. Hookham	281		

LONDON.—For alterations and repairs to the Rotunda, No. 3, Blackfriars-road, S.E. Mr. A. Broad, architect, 22, George-street, Croydon:—

Woodward & Co.	£1,116	Bulled & Co.	£946
Smith & Sons, Ltd.	1,040	W. Potter*	797
D. W. Barker	980		

MITCHAM.—For erecting a cottage, Percy-road, Beddington-corner. Mr. A. Broad, architect, 22, George-street, Croydon:—
J. J. Cooper* £365

SOUTH SHIELDS.—For rebuilding the Blue Bell Inn at Ryhope, Sunderland. Mr. Henry Grieves, architect, Albany Chambers, South Shields:—
Taylor & Welford, Sunderland* £3,255

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect:—

BONNEVILLE-ROAD SITE.—Providing and fixing fencing, &c.:—

J. Garrett & Son	£65 0	J. & W. T. Hunter	£50 10
Mitson & Co.	52 10		

BUCKINGHAM-TERRACE. — Laundry centre on arches:—

Leslie & Co., Ltd.	£1,810	King & Son	£1,571
Holloway Bros.	1,794	E. Triggs	1,543
Lorden & Son	1,750	Lathey Bros.*	1,495
C. Wall	1,700		

CHILDERLEY-STREET SITE. — Providing and fixing fencing, &c.:—

W. R. & A. Hide	£45 18	W. Hammond*	£38 15
Mitson & Co.	40 0		

[*See also next page.*

Repairs to heating apparatus on Schedule.—Groups 1, 2, 5, 8, 9, 10, 11, and 12.

Contractors.	Group 1.	Group 2.	Group 5.	Group 8.	Group 9.	Group 10.	Group 11.	Group 12.
	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
G. & E. Bradley	—	+17½	—	—	—	—	—	—
W. G. Cannon & Sons ..	+20	+20	+20	+15	+15	*+15	+15	+20
J. Defries & Son, Ltd. ..	+17½	+17½	+17½	+17½	+17½	+20	+22½	+22½
Brightside Foundry and Enginering Co., Ltd. ..	+15	*+15	+15	*+12½	*+12½	+15	+15	*+15
J. Esson	*+15	+15	*+10	+12½	+15	+17½	*+12	+17½
J. & F. May..	—	—	+52½	—	—	—	—	—
A. A. Morris & Co. ...	—	—	—	+25	—	—	—	—
J. Wontner-Smith, Gray & Co.	+30	+30	+30	+30	+32½	+32½	+35	+35

FOSSDENE-ROAD. — Manual training centre for orty boys :—

Garrett & Son.....	£1,450	Kirk & Randall	£1,378
King & Son	1,448	Johnson & Co., Ltd.	1,355
F. & H. F. Higgs ...	1,419	E. Triggs	1,297
Bulled & Co.	1,385	J. & C. Bowyer* ..	1,293

GEORGE-STREET.—New school for infants on one floor : Accommodation, 350. Providing new water-closets for male and female infants, and covered playground :—

Wall & Co.	£8,001	+ £129
Bulled & Co.	7,979	+ 90
Johnson & Co.	7,840	+ 120
F. and H. F. Higgs	7,492	+ 88
Wallis & Sons	7,182	+ 67
J. Appleby	7,174	+ 95
W. Downs	7,069	+ 125
Holliday & Greenwood.....	7,039	+ 79
J. & C. Bowyer	6,393	+ 72
W. Smith	6,381	+ 76
J. Marsland & Sons*.....	6,133	+ 60

† If walls of classrooms are plastered, *add.*

HAVERSTOCK-HILL.—Building coal-cellar in playground against Truro-street :—

General Builders, Ltd.	£197	Densham & Sons	£135
Thompson & Beveridge	150	F. T. Chinchen	132
H. Eady	148	Marchant & Hirst* ..	126

LEVEN-ROAD SITE.—Providing and fixing fencing, &c. :—

Gibb & Co.	£172 0	J. & W. T. Hunter*	£136 10
Hawkins & Co.....	153 10		

MACMURDO-ROAD SITE (Woodlawn-road). — Removing one building from Ambler-road, one from Clifton-road, one from Eltringham-street, and three blocks of offices from Rosendale-road, and re-erecting them on the Macmurdo-road site :—

T. Cruwys	£1,665	Mitson & Co.	£1,280
J. & W. T. Hunter	1,365	Hawkins & Co.	1,185
Croggon & Co., Ltd.	1,310	W. Harbrow*	1,173

PONTON-ROAD.—Drainage and sanitary work :—

Rice & Son	£2,390	0	0
Lathey Bros.	2,362	0	0
Johnson & Co., Ltd.	2,343	0	0
Maxwell Bros., Ltd.	2,321	16	8
Martin, Wells, & Co.	2,224	0	0
W. Hammond	2,219	4	5
J. & C. Bowyer	2,151	0	0
H. & G. Mallett	1,944	9	3
W. V. Goad	1,850	0	0
E. Triggs†	1,840	0	0

† Recommended for acceptance.

TRAFALGAR-SQUARE.—Special school for sixty children—three classrooms of twenty each. The plans also include a manual training centre on arches for forty boys :—

Leslie & Co., Ltd. ..	£5,583	Munday & Sons	£5,476
Treasure & Son	5,572	Lawrance & Sons ..	5,228
Perry & Co.....	5,530	Wall & Co.	5,199
L. H. & R. Roberts	5,516	Staines & Son	5,181
Grover & Son	5,502	Gregar & Son	5,157
F. & F. J. Wood ..	5,491	Chessum & Sons* ..	4,998

Supplying two science tables for the Prospect-terrace and Rhyl-street Schools :—

Spencer & Co.	£48 0	Educational Supply Association, Ltd.*	£33 10
H. Bouneau.....	38 0		
Lascelles & Co....	35 0		

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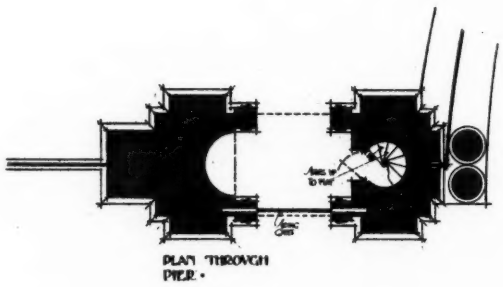
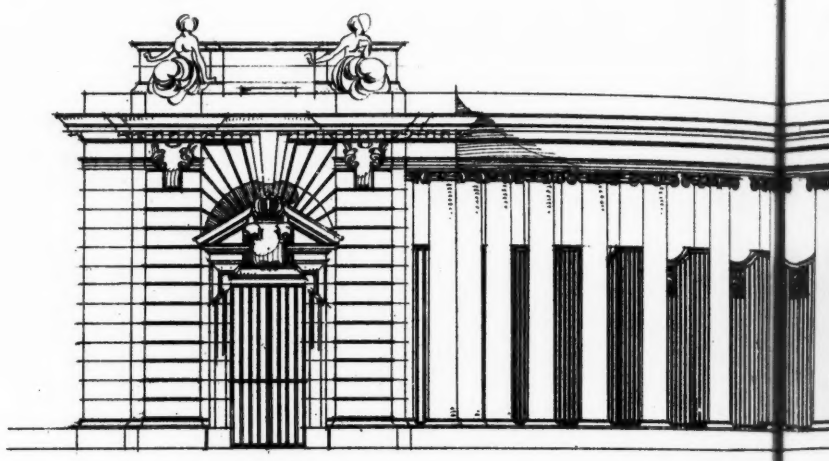
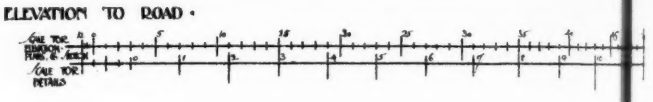
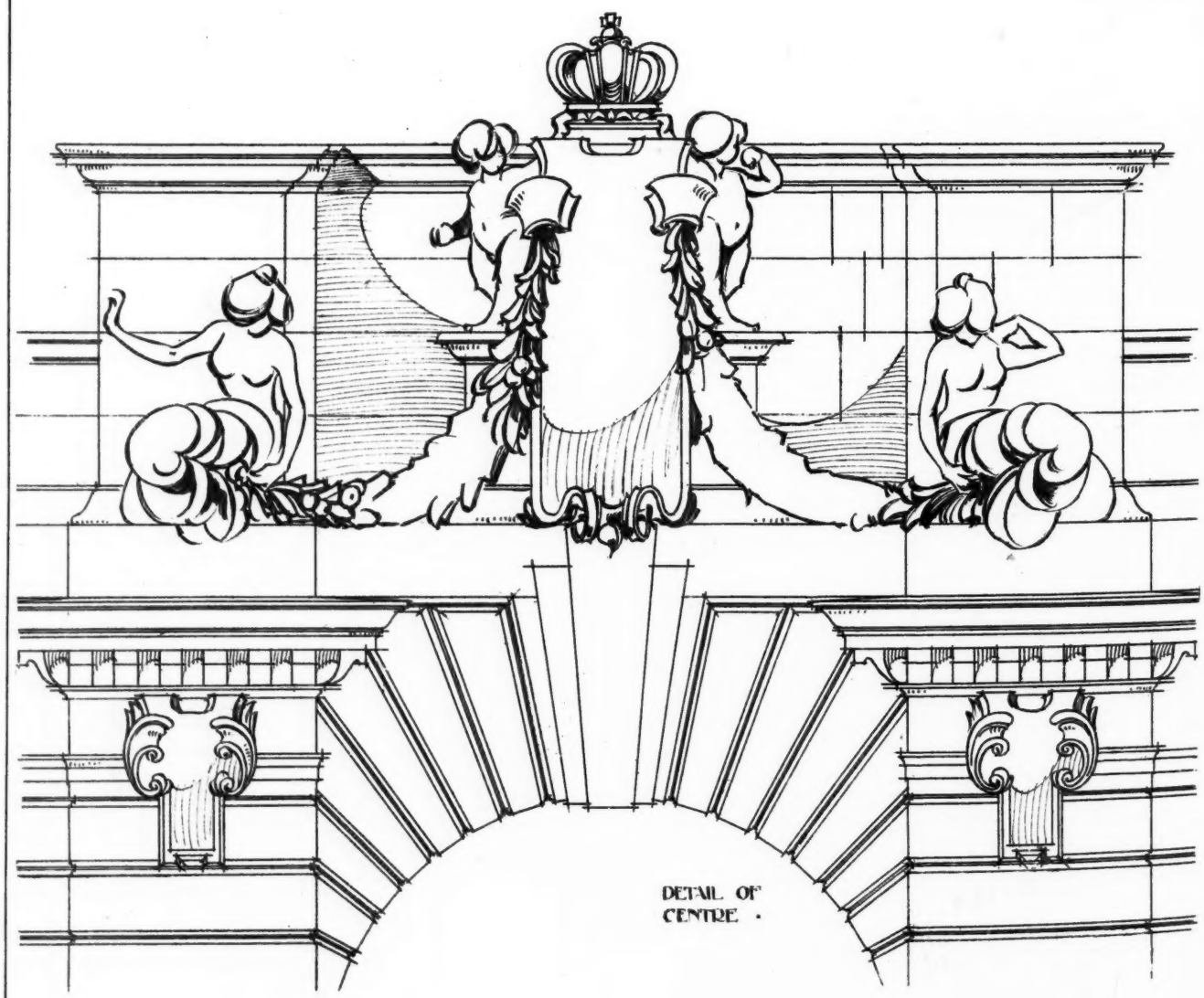


PLAN THROVGH PIER.



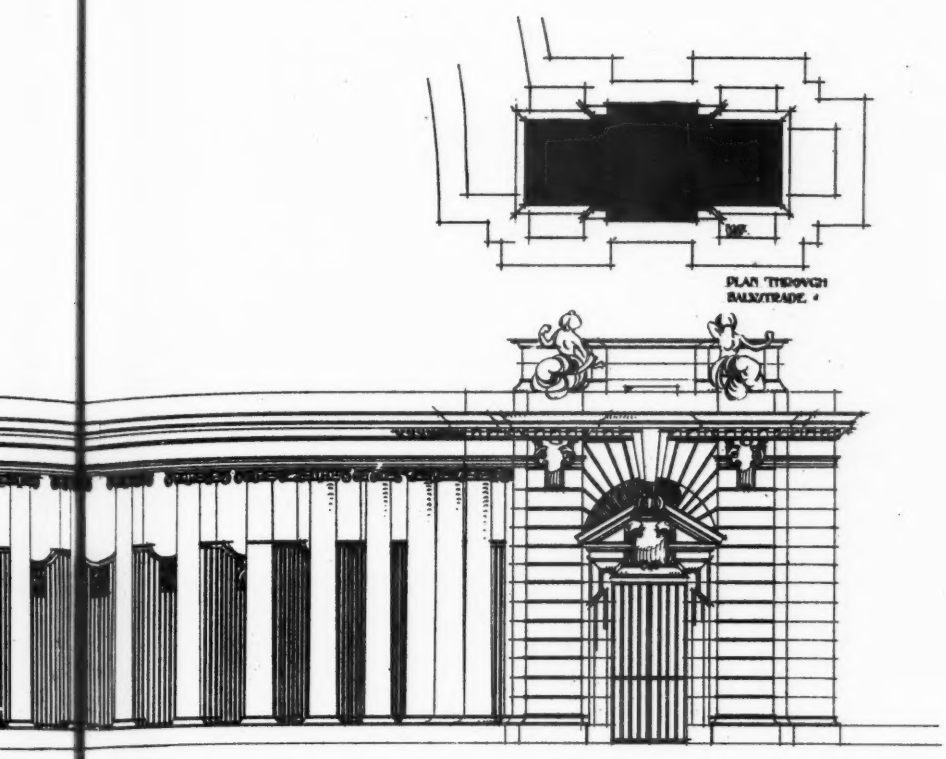
ELEVATION TO ROAD.



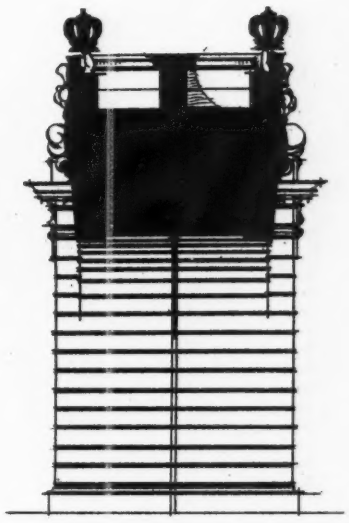


DETAIL OF CENTRE.

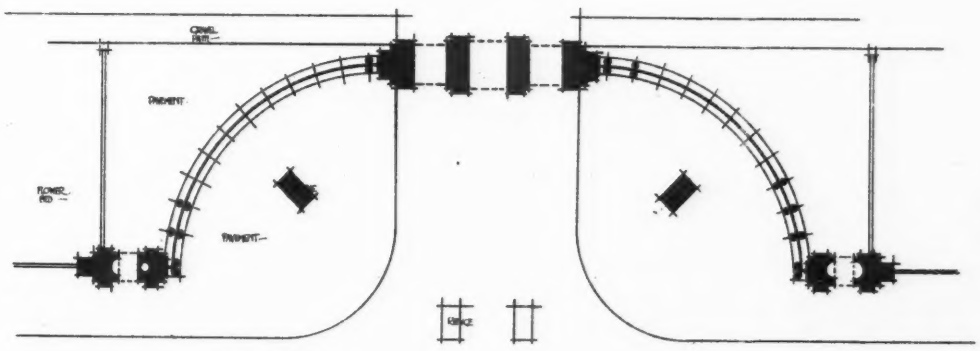
R.I.B.A. Tite Prize, 1901:
Second Prize of Ten Guineas.



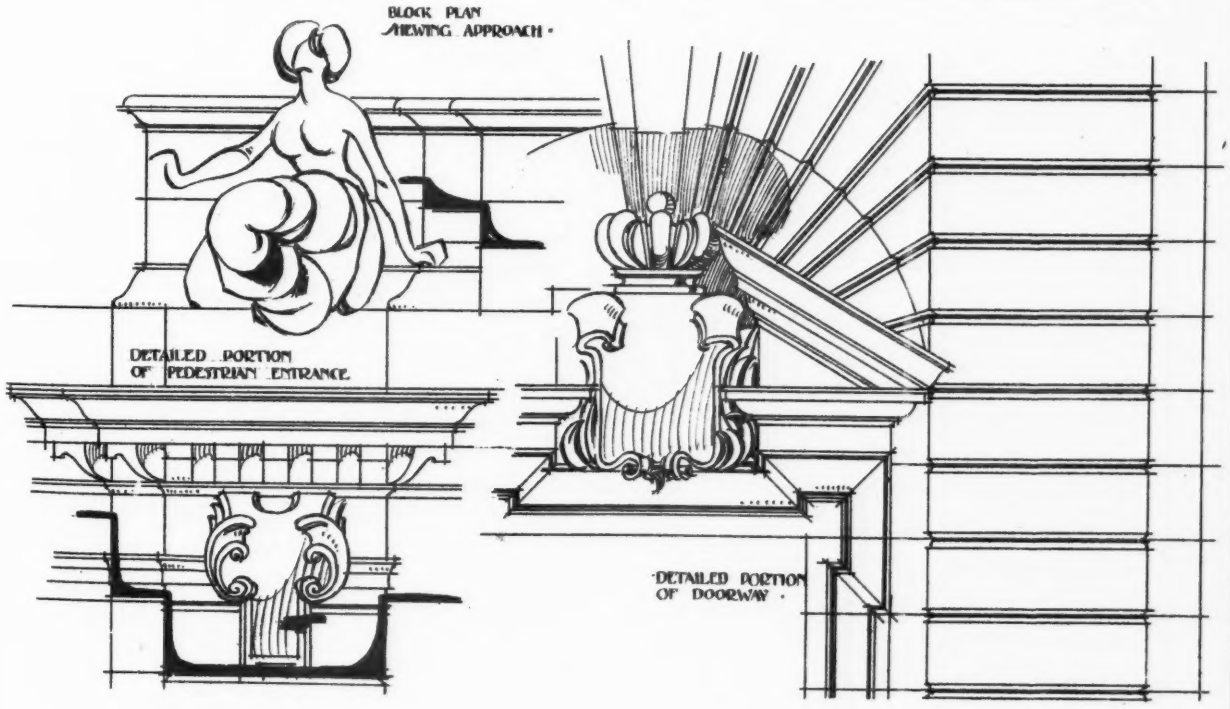
PLAN THROUGH BALUSTRADE.



SECTION THROUGH CENTRE ARCH.



BLOCK PLAN SHEWING APPROACH.

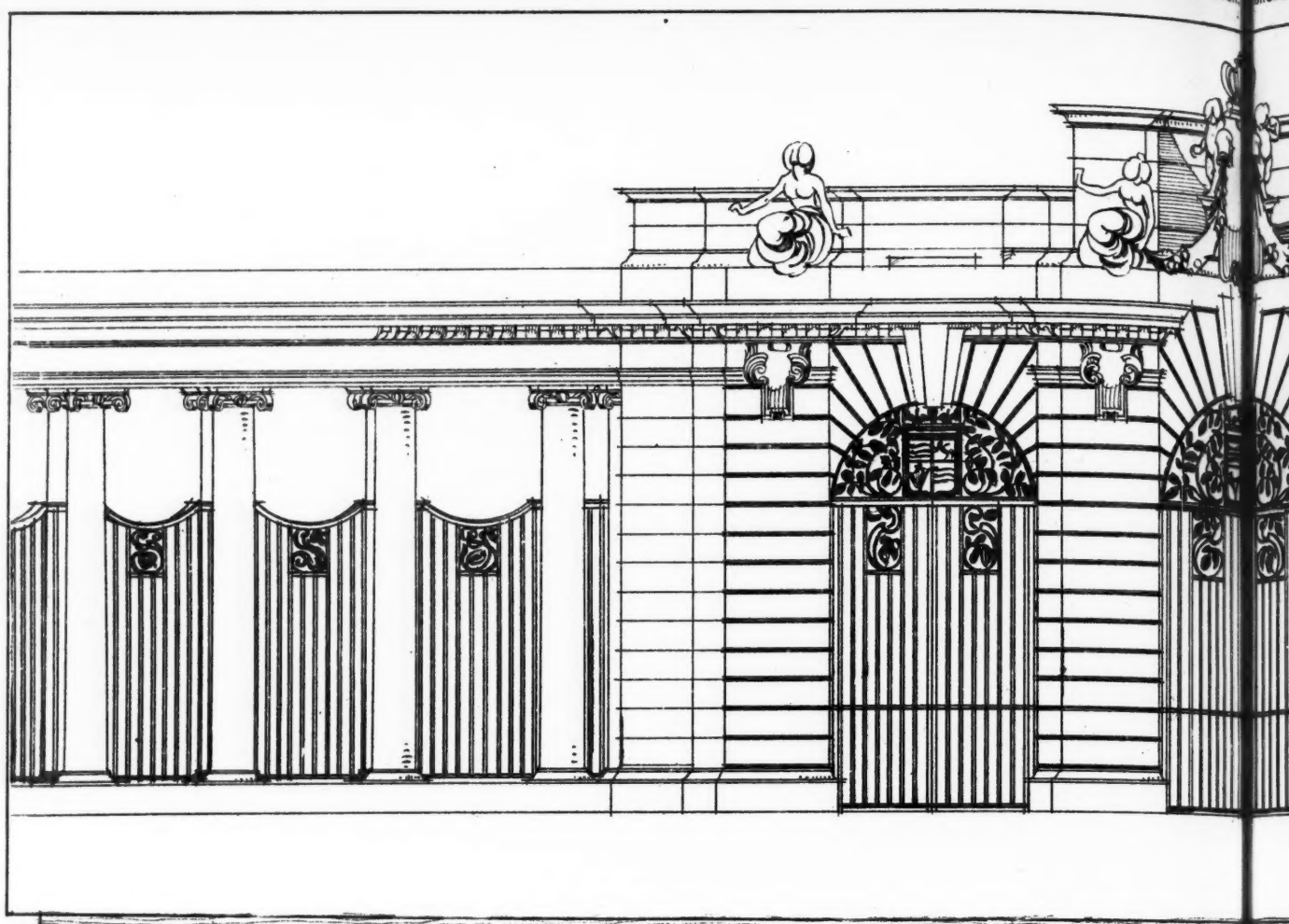


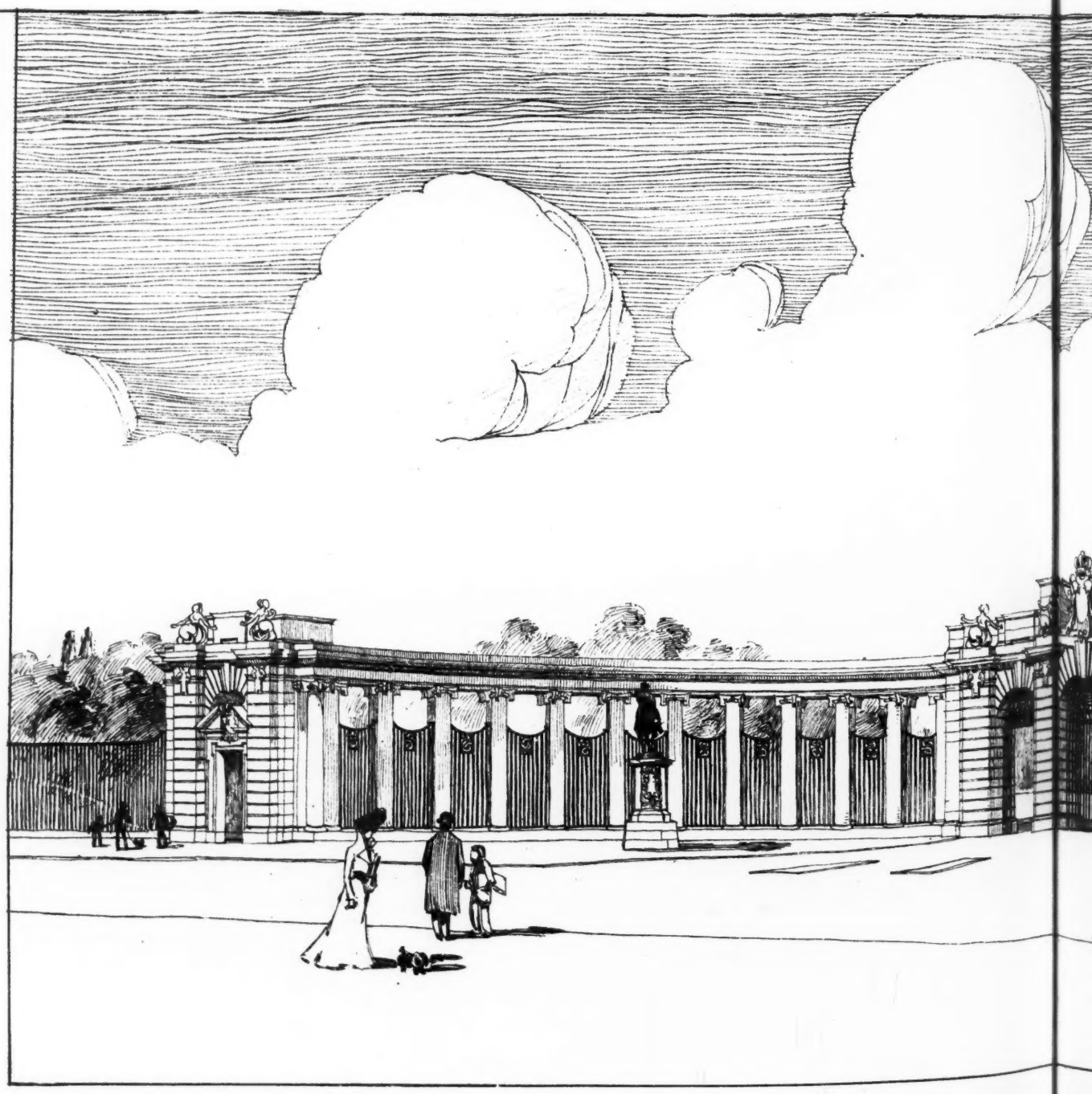
DETAILED PORTION OF PEDESTRIAN ENTRANCE.

DETAILED PORTION OF DOORWAY.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5. EAST HARDING STREET. FETTER LANE, E.C.

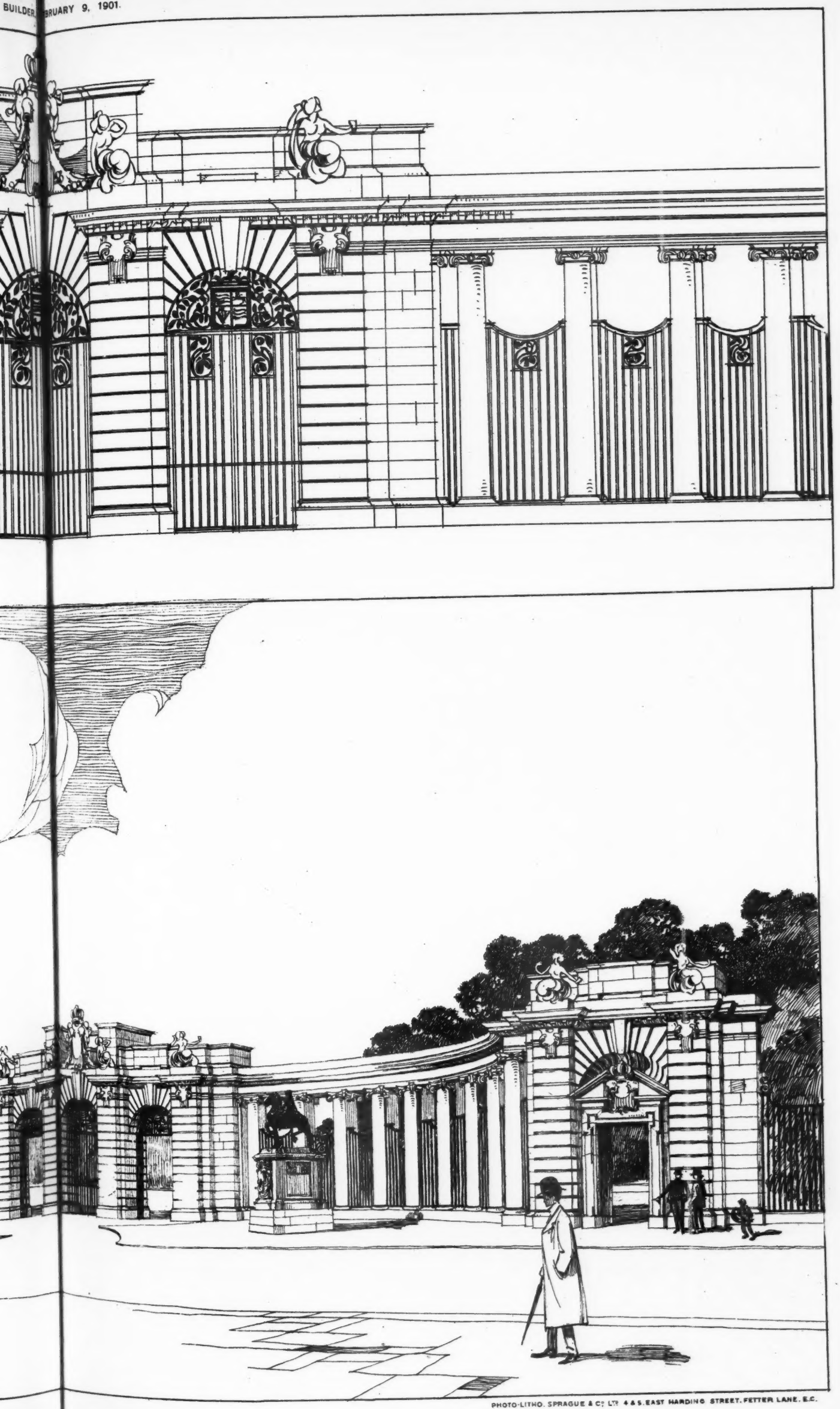
TEWAY TO A PUBLIC PARK.—By Mr. Ralph Knott.





R.I.B.A. Tite Prize, 1901:
Second Prize of Ten Guineas.

DESIGN FOR AN ENTRANCE GATEWAY TO A



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GATEWAY TO A PUBLIC PARK.—By Mr. Ralph Knott.

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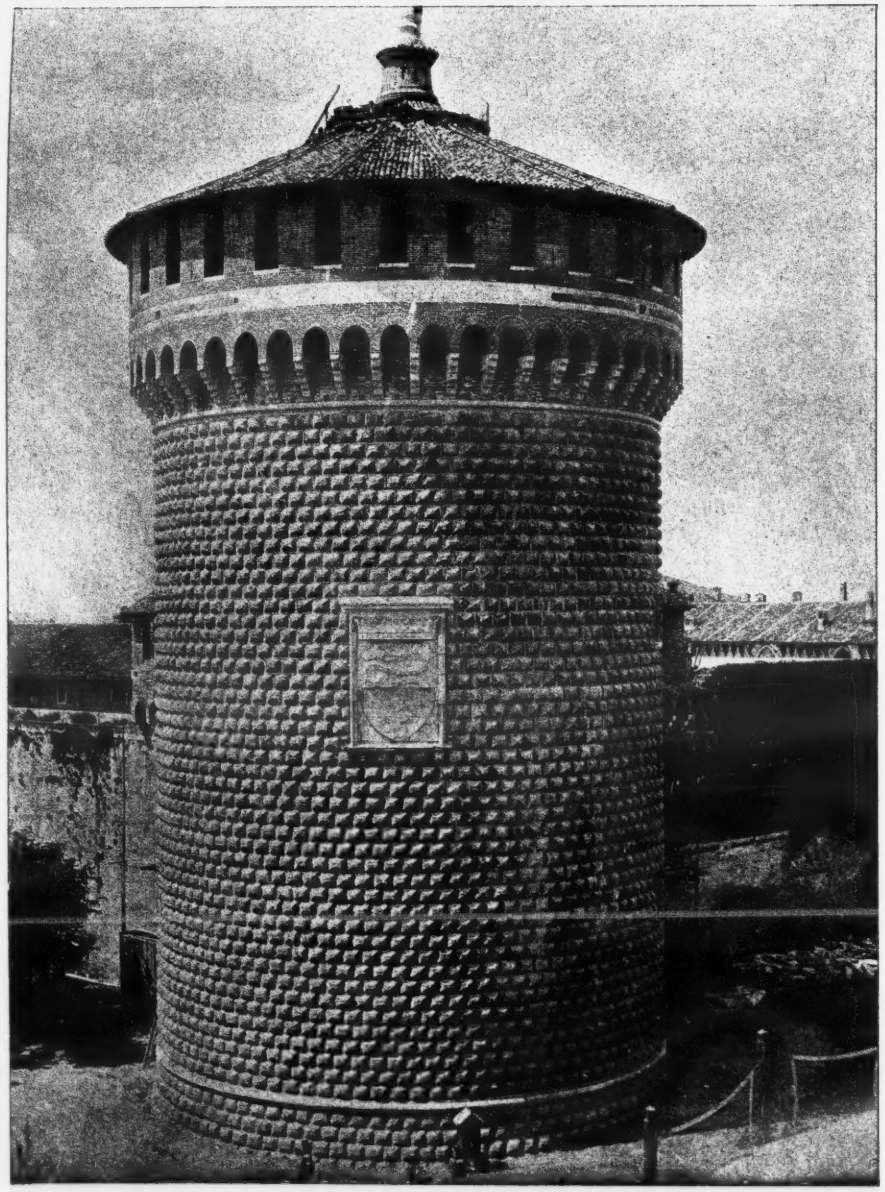

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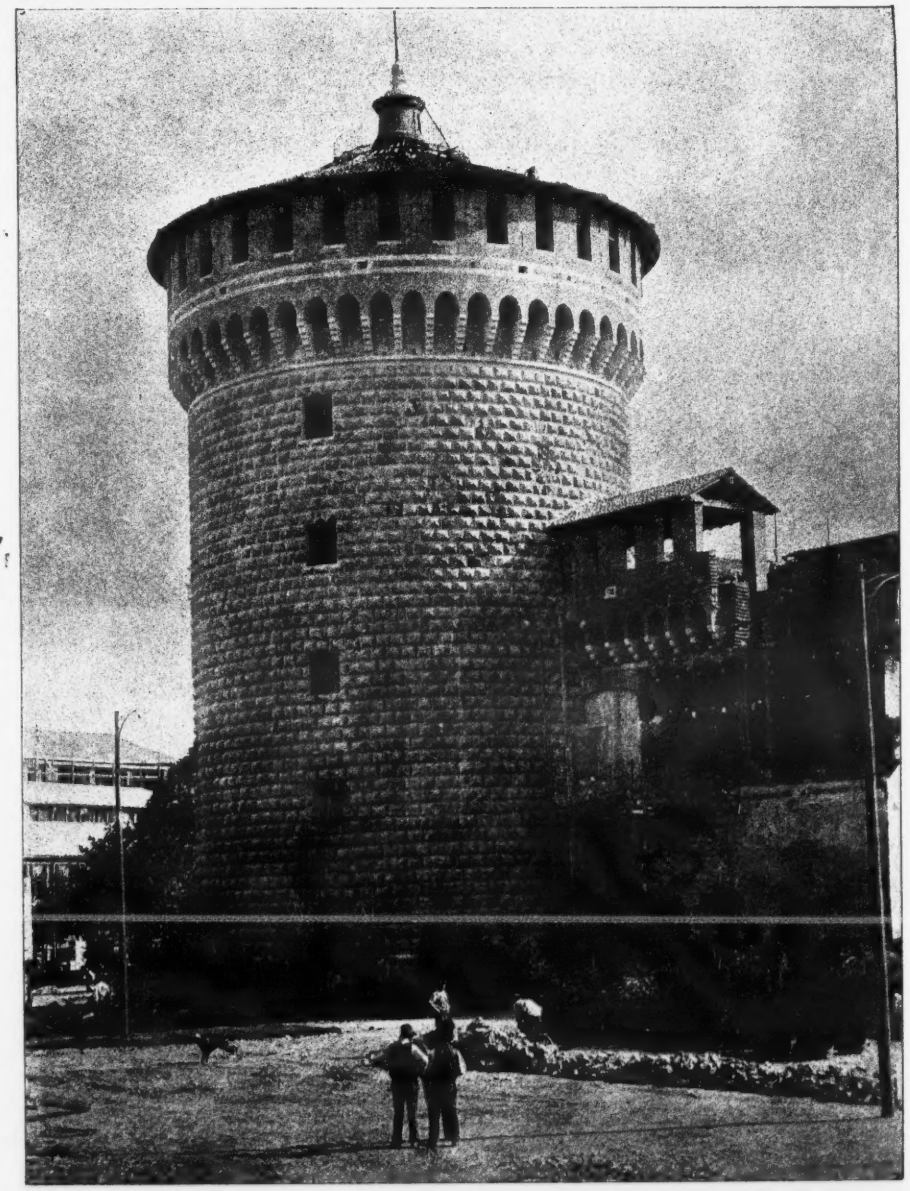

INK-PHOTO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE COURTYARD OF THE ARCHBISHOP'S PALACE, MILAN; AND ONE OF THE TOWERS OF THE CASTLE.

AS RESTORED UNDER SIGNOR MORETTI, OFFICIAL ARCHITECT.

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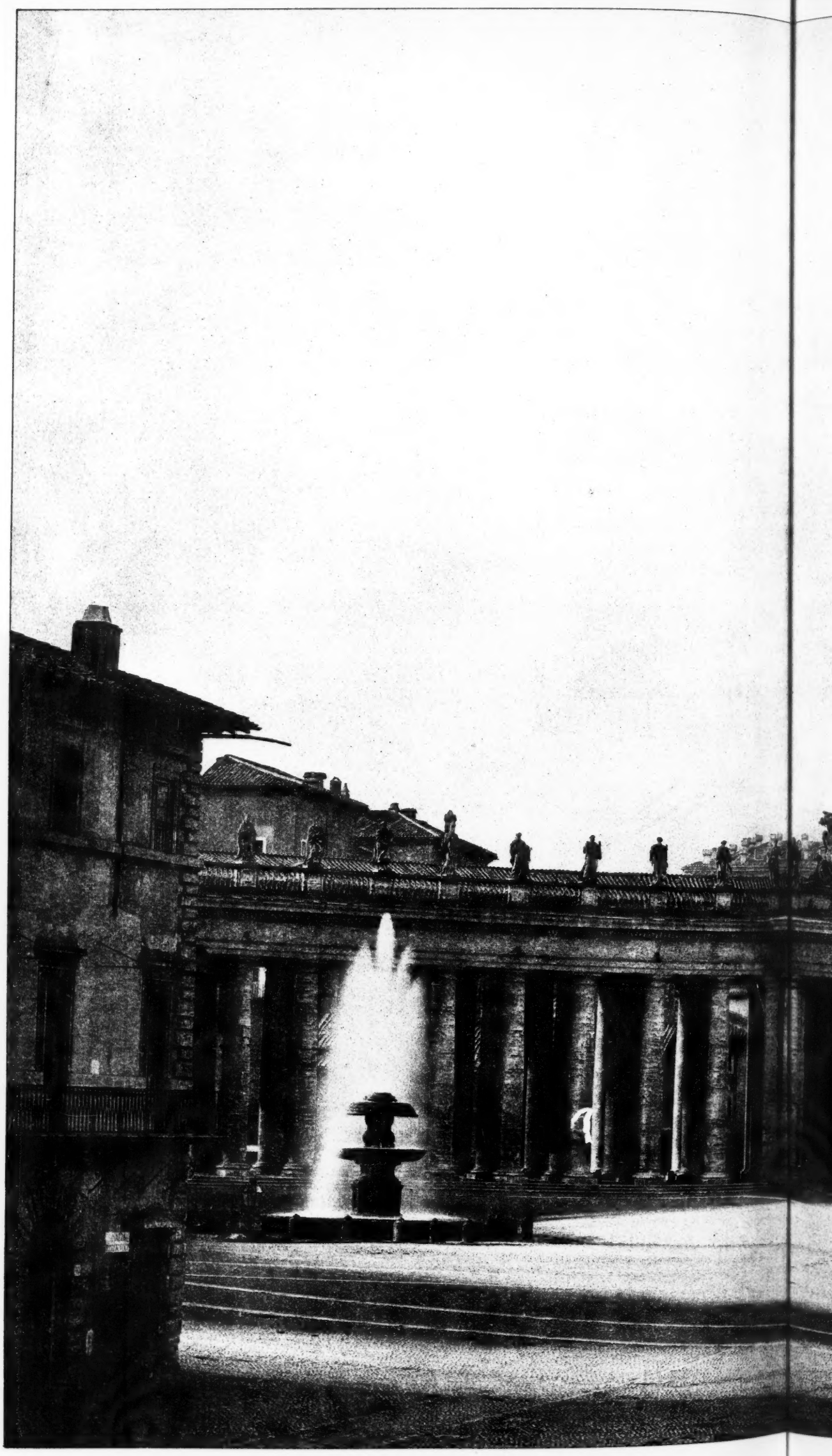

ST. PETER'S: AND BERNINI'S CO

(IN ILLUSTRATION OF PROFESSOR AITCHISON'S ROYAL

RNINI'S COLONNADES.

HISON'S ROYAL ACADEMY LECTURES.)

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